THE BUILDER

INCORPORATING

"ARCHITECTURE" AND "THE BRITISH ARCHITECT"

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THE FUTURE

HAVING survived a year of dire peril—perhaps the direst in our history—we face the New Year with a full realisation of the grim nature of the task before us, but quietly confident in our ability to withstand whatever may be in store. The Germans have shown us that their threat of total war was no empty one. We have seen our most treasured historic buildings, our churches, our hospitals, our homes go up in flame and smoke or crash to the ground in heaps of ruin before the insane onslaught from the skies.

It has been left to the Germans, with all their claims to culture and racial superiority, to pursue deliberately a policy of indiscriminate destruction, to rain death upon defenceless civilians, to destroy fine buildings of no military importance, and to attempt to engulf whole cities in flames. By their actions they have shown themselves to be worse than barbarians and have earned the contempt and loathing of the civilised world. "Let them relearn the law."

We must expect and prepare for destruction far surpassing anything that has yet happened. Great areas of our towns and cities may be wiped out. While this may simplify the task of replanning after the war, it raises many questions of detail that will have to be settled before any attempt can be made to plan anew. There is the case of the City Churches, for example, several of which have been severely damaged or partially destroyed. Should they invariably be rebuilt? The controlling consideration must, we think, be the new plan, though it is clearly impossible to lay down hard-and-fast rules on such a complicated subject.

On the ethical aspect of the question, where substantial parts of a church remain and there is no insuperable planning or other objection, few are likely to say that it should not be rebuilt. But where a building has been completely or largely demolished, is there any merit in setting up a copy in its place? "Facsimile reconstruction" may show us the outward appearance of what existed before, but it can never recapture the spirit nor be anything more than a copy, almost wholly lacking the interest and value of the original. We do not pretend to dogmatise on a subject so full of difficulty and on which there is bound to be a great diversity of well-founded opinion. We suggest that the bodies most competent to offer guidance on the subject—the Royal Fine Art Commission and the R.I.B.A., for example—might well explore the whole problem with a view to giving a lead to all concerned.

As to replanning in general, Lord Reith, the head of the recently created Ministry of Works and Buildings, has been charged by the Cabinet with the responsibility of "consulting the departments and organisations concerned with a view to reporting to the Cabinet the appropriate methods and machinery for dealing with the issues involved." Such an opportunity of substituting order for chaos should be taken advantage of to the fullest possible limit, but a method of overcoming the many obstacles that stand in the way of comprehensive replanning has yet to be found. Vested interests and short-sightedness perpetuated the mediæval plan of London after the Great Fire, and they still stand in the way of ordered progress. No removable obstruction, either material or legal, should be allowed to defeat the opportunity for comprehensive replanning, not only in London, but generally throughout the country, which will be presented to us at the end of the war.

In the meantime we may congratulate Lord Reith on the excellent start he has made on his enormously difficult task by gathering around himself a body of technical experts, particularly a number of highly competent architects and engineers of wide experience. The appointment by the Building Industries National Council of a small but fully representative committee under the chairmanship of Sir J. Walker Smith to ensure effective liaison between the industry and the Ministry is also a welcome step. It is evident that there must be much more direct contact between the industry and the Government, particularly with regard to the increased call for more and better shelters and to the necessary replacement of buildings damaged by enemy action. There is an increasing realisation of the need for the industry to forgo its separatist outlook and to co-operate wholeheartedly if its maximum contribution to the national war effort is to be made. There is a great deal to be done, too, in the organisation and rationalisation of building materials manufacture. The appointment of Mr. T. S. Tait as Director of Standardisation to the Ministry of Works and Buildings is an indication of the importance attached to this section of the building industry, not only for the duration of the war but after. So also must there be a larger measure of co-operation on the professional side.

At no other time in all our history has the building industry stood in so vital a relationship to the State. It is no exaggeration to say that the winning of the war may in large measure depend upon its efforts. The industry, we may be sure, will neglect no means of intensifying those efforts, so that the year 1941, if it does not see the end of the war, may yet make a prodigious contribution towards victory and the restoration of Peace.

ST. PAUL'S ENCIRCLED BUT SAFE.

The wanton attempt by the Nazis to burn out the City of London on the night of December 29 placed St. Paul's Cathedral in grave peril. The building was struck by several incendiary bombs, but these were dealt with by the Watch before doing serious damage. Many of the buildings around were rendered unsafe by fires, and our illustration shows the dynamiting of one structure, with the Cathedral encircled in the smoke and dust.

NOTES AND NEWS

The St. Paul's Watch.

Before beginning his sermon at St. Paul's Cathedral on Sunday morning, the Dean, Dr. W. R. Matthews, said the provident escape of the Cathedral was due, to an incalculable degree, to the foresight of the Cathedral Surveyor in preparing for such an emergency and to the devotion and skill of the cathedral staff and the volunteers who dealt with incendiary bombs in so courageous and masterly a manner that it was possible for the congregation once more to assemble for worship that day in a cathedral practically undamaged. The Dean and Chapter were grateful to those who took a part in saving the Cathedral. Their gratitude was shared by the whole population of the British Isles and by vast numbers of people throughout the world.

An article on the work of the St. Paul's Watch, with a photograph of the members (including their leader, Mr. W. Godfrey Allen, F.R.I.B.A., the Cathedral Surveyor), appeared in our issue for August 30 last.

City Companies' Damaged Halls.

Among the City buildings which have been hurt by enemy action are a number of City Company Halls. The raid of December 29 has practically destroyed the halls of the Saddlers', Girdlers' and Coopers' Companies, though many of the treasures had previously been removed to places of safety. Coopers' Hall was built in 1868, the third building in which the company has been housed. Girdlers' Hall was erected in 1681. Saddlers' Hall dated from the Great Fire, when the original building was destroyed.

Other halls which have been damaged at one time or another recently are those of the Society of Apothecaries (dating from the Great Fire) and the Fishmongers' Company. The latter's building was about 100 years old.

Another building which was destroyed on December 29 was Trinity House, Tower Hill, built to Samuel Wyatt's designs in 1795.

Land Values and Raid Damage.

In a letter to the Press, Mr. Alfred C. Bossom, M.P., F.R.I.B.A., remarks that buildings rising upon the sites of bombed structures will be more expensive and up to date. "Automatically, such improvements enhance the land upon which they stand," he states, "and not only does this enhancement come to the actual property upon which the improvement itself is situated, but it is also enjoyed by land in the vicinity. This being inevitable, we shall soon find bombed areas and land where large improvements are to be made being surreptitiously acquired at to-day's bargain price—to be held for the inevitable increase to, possibly, double or even treble its present price. . . . Is it not desirable, therefore, that consideration be given soon to bringing into being the necessary legal machinery to ensure that all profits from increased land values come to the benefit of the nation, and are not allowed to flow into the purses of a limited few?"

Bombed Shops and Temporary Replacement.

Coventry City Council considered on December 24 the question of the erection of temporary shops on sites from which tradespeople have been bombed. The City Redevelopment Committee recommended that temporary buildings should be erected for twelve months, with reconsideration at the end of that period, but there was considerable support for an amendment that the period should be three years or six months after the end of the war, whichever is the earlier.

A discussion ensued before the recommendation was carried by 20 votes to 15. Supporters stated that it was desirable to have control of the sites to safeguard future development. Against this it was argued that the city would lose considerably in rateable value, for tradespeople would not erect temporary shops under such conditions.

Bristol traders who have had their premises bombed are to petition the City Council for help in erecting one-storey buildings in which to carry on their businesses and the speedy clearance of sites.

Copies of "The Builder" Required.

Copies of the issues of *The Builder* for January 6, 1900, and January 6, 1906, are urgently required by a Learned Society. Anyone who has these copies to dispose of is requested to write to the Secretary, R.I.B.A., 66, Portland Place, W.1.

New Year Honours.

The following names appear in the New Year Honours List:—Knight Bachelor: Frank Brangwyn, R.A.—Order of the Bath (C.B.): Ernest Holloway, Director of Works, Air Ministry.—Order of the British Empire: Frank Dorrington Ward, F.R.I.B.A., lately Government Architect, Malayan P.W. Service (O.B.E.); Herbert J. B. Manzoni, City Engineer and Surveyor, Birmingham (C.B.E.); Ernest H. Ford, City Engineer and Surveyor of Coventry (O.B.E.); Hubert Marston Webb, City Engineer, Bristol (O.B.E.); John Wilson, F.R.I.B.A., Chief Architect, Department of Health for Scotland (O.B.E.); and Thomas Percival Fish, Maintenance Surveyor, Ministry of Works and Buildings (M.B.E.). The honours conferred on Messrs. Manzoni, Ford and Webb are for services in connection with Civil Defence.

COMPARATIVE PRICES OF MATERIALS

The following table shows the difference in price of a few representative materials to-day as compared with a year ago:—

	January, 1940. £ s. d.	January, 1941. £ s. d.
Flettons	2 6 3	2 12 3
White Midhurst	3 12 6	3 12 6
Portland Cement	2 5 0	2 9 6
Grey Stone Lime	2 2 0	2 12 6
Bath Stone	2 10½	2 11½
Portland Stone	4 5	4 6
Building Timber—		
4 × 11	38 10 0	43 10 0 to 53 0 0
3 × 11	38 10 0	
3 × 9	37 10 0	
3 × 4	30 0 0	
Slates—		
24 × 12	31 5 0	34 17 6
20 × 10	20 15 0	24 0 0
Tiles—		
Machine-made	4 2 6	5 10 0
R.S. Joists	16 0 0	22 10 0
Raw Linseed Oil	4 3	5 4
Turpentine	6 0	5 5
Ground English White Lead	59 10 0	61 0 0
White Lead Paint	79 0 0	83 10 0
Red Lead	52 0 0	52 0 0
Sheet Lead	34 10 0	34 10 0
Glass—		
18 oz. O.G.	2½	2½
24 oz.	3¼	3¼
26 oz.	3¾	3¾

Changes of Address.

The County Architect's Department of Zetland County Council has removed from 30, Commercial-street, Lerwick, to new premises at Brentham-place, Lerwick. Mr H. K. Macdonald is the County Architect.

Owing to unforeseen circumstances the Council for the Preservation of Rural England (C.P.R.E.), and Council for the Preservation of Rural Wales (C.P.R.W.) have moved from Hughenden Manor to Old Raven House, Hook, near Basingstoke, Hants.

Professional Announcement.

Messrs. Searle and Searle, architects and surveyors, announce that their offices at 34, Paternoster Row, E.C.4, have been destroyed by enemy action. A new office has been opened at 6, Old Bailey, E.C.4 (City 2471, Extension 16) where the practice will be carried on as usual. Trade diaries and catalogues will be welcomed.

Sir Raymond Unwin's Estate.

Sir Raymond Unwin, P.-P.R.I.B.A., left estate valued at £8,229.

Industrial Housing Competition Exhibition.

An exhibition of the winning and premiated designs and drawings in the Industrial Housing Competition, recently held by the Royal Institute of British Architects, was opened in the Scottish Building Centre, Glasgow, by Mr. C. G. Soutar, P.-P.R.I.A.S., Vice-President of the R.I.B.A., on Monday, December 23. The exhibition will remain open until Friday, January 10. The winning designs in the competition were illustrated in our issue for September 13, 1940.

Rebuilding Scotland.

The B.B.C. announces that on January 11, at 4.15 p.m., a talk will be given by Mr. Robert Hurd on the subject of rebuilding Scotland. This Scottish architect has made an extensive study of the restoration of old buildings, and he has already done much to save some of our fine old Scottish buildings from ruin. Mr. Hurd's talk on this occasion will give his suggestions for the rebuilding of a new Scotland after the war.

IN 1916.

Extract from *The Builder*, January 14.

"It is to be hoped that the [City] churches which remain will be preserved, since the value of their sites, great as it may be, is small compared with the value of the historic associations of the buildings, forming a link as they do with the old London of history. Apart from this, their value as architectural monuments is enormous, as we should realise by imagining Ludgate-hill without St. Martin's, Cheapside without St. Mary-le-Bow, and Fleet-street without St. Bride's."

THE ROYAL GOLD MEDAL

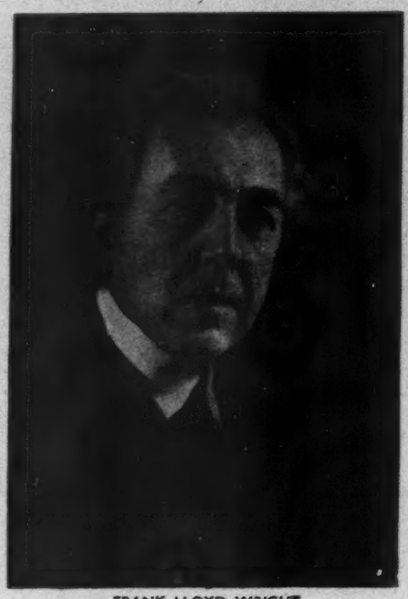
NOMINATION OF MR. FRANK LLOYD WRIGHT

As we announced in our last issue, Mr. Frank Lloyd Wright has been nominated by the Royal Institute of British Architects to His Majesty the King as recipient of the Royal Gold Medal for Architecture, 1941.

Alexander Woolcott, the famous American author, has written of him: "I think that no one in the modern world has brought to architecture so good a mind, so leaping an imagination, or so fresh a sense of beauty. Indeed, if the niggardly publisher of this book ('While Rome Burns') were so to ration me that I was suffered to apply the word 'genius' to only one living American, I would have to save it up for Frank Lloyd Wright."

As a pioneer of modern architecture his buildings and the ideas underlying his work have had an incalculable influence on architectural thought and practice throughout the world. For many years his influence was less in his own country than in Germany and Holland; nevertheless, a characteristic feature of his work, and the one which he has been most eager to emphasise, is its essential American quality. He developed and extended the line of American modernism which originated with H. H. Richardson and his own master, Louis Sullivan. "I felt sure," he said in the first of the Sulgrave Manor Board lectures that he gave at the R.I.B.A. in 1939, "that architecture which was really architecture proceeded from the ground, and that the terrain, the native industrial conditions, the nature of materials, and the purpose of the building must inevitably determine the form of character of any good building."

Lloyd Wright was born in Wisconsin, his father a Baptist clergyman, his mother the daughter of a Welsh Unitarian. After training as an engineer in Wisconsin University, he worked first in the office of J. L. Silsbee. His first building, in 1887, was the Hillside School for two of his aunts, pioneer progressive educationists; in the same year he entered the office of Adler and Louis Sullivan, where immediately he achieved a place of importance as a designer, and prospered sufficiently to build a house for himself, his second building, in 1888.



FRANK LLOYD WRIGHT

During the next decades he developed in Illinois his first characteristic style known as "Prairie Architecture," low-lying buildings with strongly developed horizontals and deep, overhanging eaves. His "Prairie Architecture" reached its climax with the Robie House of 1908 and his own first house at Taliesin in Wisconsin, where he founded a settlement, which still continues under his direction as an architectural school and as a vigorous centre of his influence. Another important house of this period was the Coonley House of 1908.

Already in these early designs Wright made what is probably his greatest contribution to the development of modern architecture in evolving the "open plan" which since then has become one of the most significant characteristics of advanced contemporary design.

This open planning, in which solid structural sub-divisions are reduced so that rooms merge into each other and into the open air, arose out of Wright's quick response to the conditions of modern life, which he was enabled to express through the brilliant use of new forms of construction.

In 1904 he built his first important office building, the Larkin Building in Chicago.

In 1910 and 1911 signs of his growing influence in Europe were shown by the publication of books on his work in Germany, one of which was introduced by Mr. C. R. Ashbee, a leader of the most progressive English architecture of the day, the first Englishman publicly to acknowledge Wright's great abilities.

During the 1914-18 war Wright built the Imperial Hotel in Tokyo and profited permanently from the influence on his work of Japanese architecture. In the hotel he used an unorthodox system of construction which, at first derided by critics, proved to be so brilliantly adapted to its special site conditions that the hotel was the only building of its size that survived the earthquake unharmed.

Back in America after the war, Wright passed through the period of his career of least achievement, though, despite neglect and lack of opportunity, he continued to develop his ideas and built several important houses, including the Millard House of 1921, the best known of his pre-cast concrete-block houses, in which an all-over richness of surface design and emphasis of wall was combined with essential simplicity of form. His brilliant conception of the open plan was developed and adapted to this new phase.

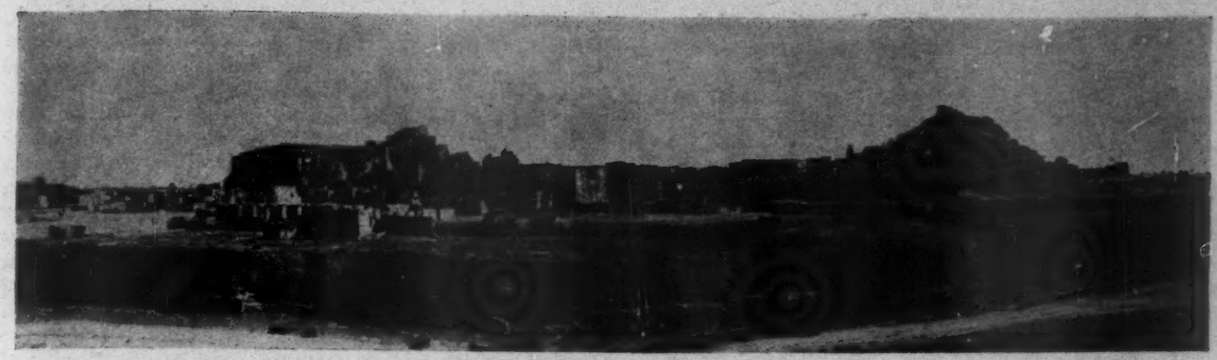
In about 1930 he entered on the present great period of his career. The work he has done in the last decade equals anything in his previous years, and now, in his seventy-first year, he retains the vitality and inventiveness and the constantly alert technical competence of a young man.

Outstanding buildings of recent years include "Falling Water," near Pittsburg, spectacularly built over a waterfall; a group of experimental low-cost houses, called the Ardmore Experiment; the Jacob House, and his largest industrial building, a large administrative block for the S. C. Johnson Company, Racine, Wisconsin, which incorporates some of Wright's most original and progressive structural designing. In Arizona the members of his "Taliesin Fellowship" have built with their own hands a desert camp, a group of gaily coloured stone and timber buildings which show the infinite adaptability of his genius to fresh country and conditions.

In recent years he has developed his town planning ideas and has planned "Broadacre City," a new form of city community consisting almost entirely of smallholding estates, symptomatic of the "back to the land" ideas which are threaded through all his recent work.

In the Spring of 1939 Lloyd Wright came to England as the honoured guest of the Sulgrave Manor Board to deliver a series of lectures at the Royal Institute of British Architects. Wright's visit and the stir it caused, particularly among the younger English architects, is memorable.

"Falling Water," Bear Run, Pennsylvania, one of Frank Lloyd Wright's more recent works.

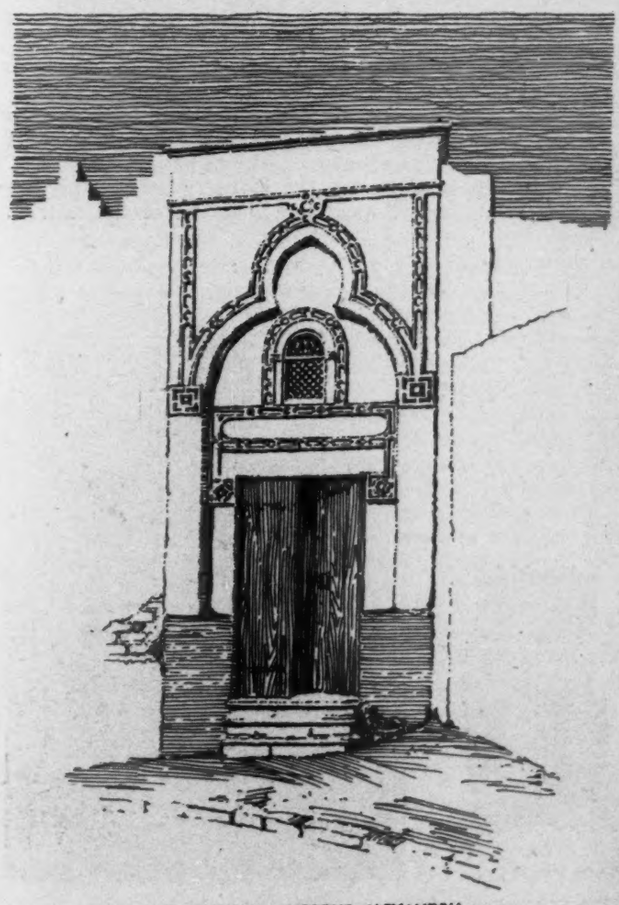


THE FORTRESS-TOWN OF SIWA.

ARCHITECTURE IN THE EGYPTIAN WAR ZONE

BY MARTIN S. BRIGGS, F.R.I.B.A.

THE north-western part of Egypt, whence the British army has recently driven the Italians, is almost unknown to tourists and lies far away from their usual route from Cairo to Aswan by way of the Nile. One cannot pretend that it compares in interest, architectural or otherwise, with the famous cities and temples on a traveller's normal itinerary. In fact, it consists almost entirely of uninhabited desert, with a few small settlements—none of them constituting a town—along the three hundred miles of Mediterranean coast from Alexandria to Sollum, plus the interesting oasis of Siwa, lying about 150 miles inland from the sea and near the Egypto-Italian frontier. Of the few Europeans who have previously visited these remote places, most are Englishmen now middle-aged, who spent varying periods of military service there some twenty-five years ago, when there was a brief campaign against the warrior-sect of the Senussi, supported by German submarines and secret agents. Thereafter small garrisons were maintained at Sollum, Matruh and Siwa until the end of the so-called "Four Years War" of 1914-18. It was thus that I had an opportunity of seeing, sketching and photographing places which would never be visited by an ordinary tourist; and, in the hope that some readers of this journal will be interested in a part of the world where many of their friends must now be stationed, I have unearthed sundry sketches and photographs made in 1917, and have written the following short description of the scanty examples of historical architecture in that unhackneyed region.



DOORWAY OF A MOSQUE, ALEXANDRIA.

Presumably most or all of the members of our new Egyptian Expeditionary Force began their westward trek from Alexandria, a great port and city about which it may seem superfluous to say anything in an article of this kind. Perhaps it is not generally known that E. M. Forster, the distinguished novelist and literary critic, produced in 1922 an excellent little book, *Alexandria: a History and a Guide*, soon after the conclusion of his own service with the army in Egypt. To that book (published locally by Messrs. Whitehead, Morris, Ltd.), all soldiers who wish to know about Alexandria should turn. But those visitors who expect to find extensive remains of the famous city of Alexander, Cleopatra, Hypatia and Euclid, with all its wonderful Hellenistic art and its world-famed library, will be grievously disappointed, for most of the sites and nearly all the buildings have been obliterated, their place being now occupied either by dust heaps or by modern buildings which are mainly commonplace.

The chief street of Alexandria, the Rue Rosette, does indeed mark the site of the main artery of the Hellenistic city, but the whole configuration of the town and harbour has been completely altered. Originally the famous "Pharos" (= lighthouse), one of the Seven Wonders of the World and alleged to have been 400 feet high, stood on an island at the entrance to the harbour, its site being marked by the present Fort Qayt Bay (see facing page). This island was connected to the mainland by a long wide causeway, the Heptastadium. But rubbish was tipped on each side of the causeway, the waters of the Nile silted up against it, and now a broad tongue of land, covered by the Arab Quarter, connects the island with the town.

The only surviving monuments of all Alexandria's ancient splendour are the remarkable series of Hellenistic underground tombs and catacombs. Of these, the best known for many years are the two groups at Anfushy and at Kom ash-Shugafa. The former lies on the "island" of Pharos, near the palace of Ras et-Tin; the latter on the south of the city, near Lake Mariut. As they belong to the Roman period, about the 2nd century A.D., they are

Ptolemaic in character, *i.e.*, Greco-Egyptian. Of the two groups, those at Kom ash-Shugafa are the finest and most interesting, and Mr. E. M. Forster rightly describes them as unique, for nowhere but in Alexandria could such a blend of styles have been created. Recently another group has been excavated at Mustafa Pasha, an eastern suburb of Alexandria which was very familiar to soldiers in the Four Years War. The date of these appears to be 3rd-2nd century B.C., and their style is Hellenistic-Doric. Mr. Theodore Fyfe, in his book on *Hellenistic Architecture* (1936) writes that they "are finished very delicately and their details would have delighted Sir John Soane. Apart from their piquant plasterwork, they show many evidences of colour." To understand Hellenistic art, the civic Museum should also be visited.

The sole relic of the mediæval city is the Fort of Qayt Bay on the former island of Pharos, built in 1479 by the great Mameluke ruler of Egypt who contributed so many magnificent mosques and tombs to Cairo. The noble gateway of the fort is illustrated here from one of my photographs. Within the fort is Qayt Bay's mosque, the oldest in Alexandria and designed in the Cairene style. The monolithic granite columns at the entrance are said to have been taken from the ancient Pharos, which perished in a series of earthquakes and other disasters between the 8th and 14th centuries A.D.

The other mosques of the city are all later, mostly of the seventeenth or eighteenth centuries, and include those of Terbana (1684), Chorbagi (in the Rue al-Maidan, 1757), Abu al-Abbas Mursi (1767), and Nebi Daniel. But some of them are mediæval in appearance, as my sketch of a picturesque doorway shows. This is in the so-called "Delta" style, with interesting brickwork, which is seen at its best in the neighbouring town of Rosetta, well worth a visit. The Turkish quarter of Alexandria, including the Rue de France and the adjoining streets, is decidedly quaint, but does not compare with the older streets of Cairo, which is the place to study mosques. It may be that the past twenty years have produced original and striking modern architecture in Alexandria ; otherwise, a soldier will probably find more pleasure in a visit to the beautiful Nuzha Gardens or a walk along the lovely coast from Stanley Bay past the woods of Montaza to Abukir, east of the city.

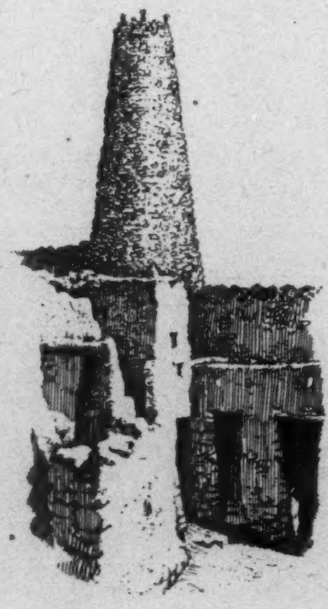
Alexandria lies on a strip of sand between the sea and the great shallow mere known as Lake Mariut. This lagoon is one of several situated at the mouth of the Nile Delta, and is enlivened by picturesque lateen sails and flocks of pink flamingoes. Soldiers bound for Matruh, terminus of the "Mariut Railway" and resently advanced headquarters of our army, leave Alexandria by rail or road along the narrow strip of sand with the Mediterranean on their right and Lake Mariut on their left. Some 25 miles from the city is the station of Behig, whence travellers may visit the famous buried city of Abu Menas, built in the fourth and fifth centuries A.D. to commemorate the life of St. Menas who died A.D. 296. It contains one magnificent basilican church, several smaller ones, and other buildings of interest fully described in monographs by the German archæologist Kaufmann. Abu Menas is the only place of outstanding architectural interest on the coast from Alexandria to Sollum, but, as it lies eight miles from the station, serving soldiers may not have an opportunity of visiting it.

North of Behig station, and close to the sea, are two ruined monuments marking the site of the ancient city of Taposiris Magna (now called Abusir). One is the lower part of a Roman stone lighthouse or pharos, illustrated in one of my photographs. The other, a few hundred yards away, is a great Roman-Egyptian temple, nearly 300 feet long. It was probably dedicated to Osiris, but little remains of any ornament or detail. The lofty stone pylons, grooved as usual for tall wooden masts, still stand, together with the massive walls. Near the temple are various chambers hewn in the solid rock, some of them containing wells and some having vaulted roofs.

Going west from Behig, one traverses a district scattered in early spring with a wealth of flowers : asphodel, anemones and "Mex lilies" (amaryllis). At Sidi Abd ar-Rahman there is a large white pilgrimage-mosque, formerly a centre of Senussi activity, standing near the sea. Just over 100 miles from Alexandria is the station of Ed-Dabaa, with a few unimportant buildings. This place (the ancient Zephyrium) was the terminus of the railway during the Four Years War. The remaining 80 miles to Matruh are equally devoid of architectural interest, and the almost empty country displays few habitations except the black tents of the Bedawin.

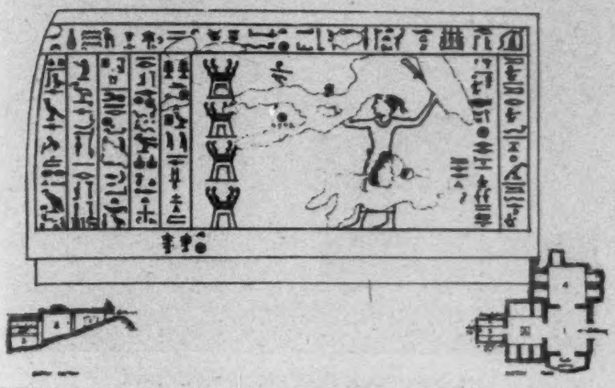
Mersa Matruh (*mersa* = harbour) is a small settlement that assumed some military importance in 1915-1917 as it has done again to-day. In peaceful times it is a centre of the sponge-fishing industry and a minor centre of civil administration. It is then occupied by a handful of officials, a few fishermen, and a few Greek traders who supply the simple wants of the wandering Bedawin of the district.

GATEWAY OF FORT QAYT-BAY [1479], ALEXANDRIA.



MINARET OF MOSQUE AT AGHURMI.

ROMAN PHAROS NEAR BEHIG.



DETAILS OF THE "TOMB OF ARTAXERXES" IN THE JEBEL MUTAR, SIWA OASIS.

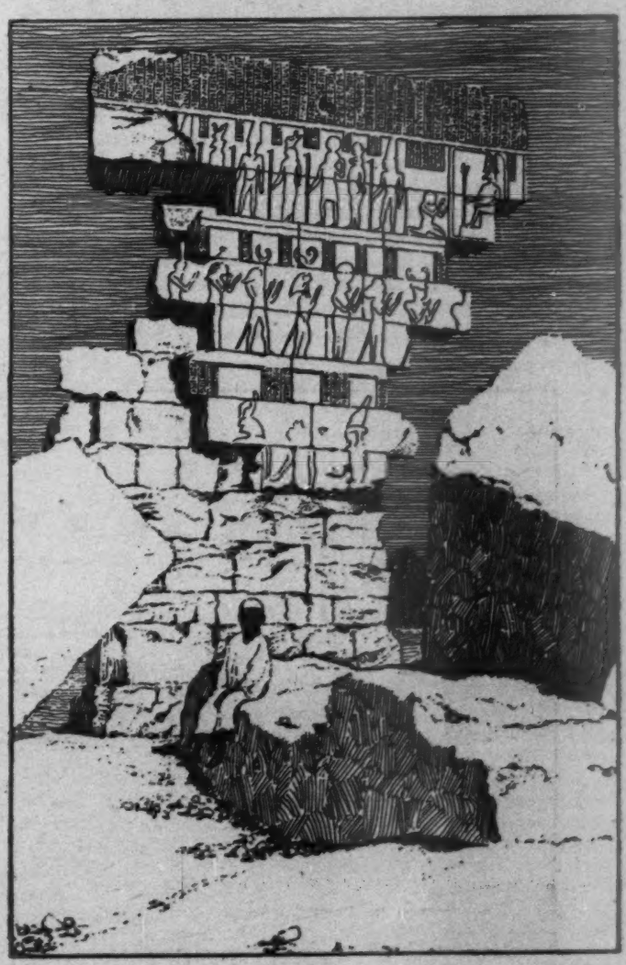
Matruh, although it often figures in the newspapers nowadays, is not in any sense a town, and shortage of water will always prevent its becoming one. There is a rather prominent modern mosque near the seashore, a somewhat dilapidated Turkish fort used as a coastguard-station, a rest-house, a court-house, a telegraph-station, some shops of a sort, and a number of small houses of stone, roughly plastered over, and covered with flat roofs. The shallow harbour is the chief feature of the place and its brilliantly clear water provides excellent bathing.

But in ancient times Matruh, under its classical name of Parætonium, was a town of some importance; and it was from here that Alexander the Great began his famous march of 200 miles across waterless desert to the oasis of Siwa, to consult the oracle of Jupiter Ammon there. Much later it became the seat of a Roman garrison, and legend connects it with Anthony and Cleopatra, whose numerous honeymoons seem to have extended all along the Egyptian coast. There are vague traces of buildings near the harbour, one commonly called "Cleopatra's Villa," the excavation of which by American archæologists was interrupted by the war in 1916. Probably the site would yield fruitful discoveries to scholars, and it is to be hoped that it has not suffered damage during the present military operations.

From Matruh to Sollum the road runs close to the sea through almost uninhabitated country, desert in the summer, brilliant with flowers in the early spring. Sidi Barrani and Buq Buq, names figuring frequently in the newspapers, are mere outposts, blockhouses or coastguard stations. Sollum itself, now in British hands, lies just over 300 miles west of Alexandria, at the point where the lofty Libyan plateau touches the sea. It is a small settlement, hardly a village, with a tiny harbour commanded by the high cliffs behind it, some barracks, and even fewer small stone houses than Matruh. One day in 1917 I climbed the steep road to the top of the escarpment, crossed the frontier, and spent some pleasant hours exploring ancient rock cisterns in company with a charming Italian officer who was in charge of a small detachment of soldiers. Sollum contains no architecture whatever, and in fact there is nothing of architectural interest along all this coast, save only the city of Abu Menas, to compare with the queer buildings in the Siwa oasis, far away in the desert to the south of Matruh and Sollum.

Up to 1916, Siwa was hardly known to Englishmen and only a few bold explorers had penetrated there. The journey by camel from Matruh took seven days over a waterless and arid desert where, even in winter, the heat of the sun was trying, and in summer pitiless. The track from Cairo was better supplied with wells but the journey took seventeen or eighteen days. When I visited the oasis in 1917 I was lucky enough to be driven there in a single day in a large car, but I made the return journey a week later with one of the ration-convoys of "light cars," which supplied the small outpost of troops stationed in the desert just above the oasis, and that took two days to cover the 200 odd miles. The route is quite featureless, defined only by camel-tracks, wheelmarks and bleached bones. At intervals it passes over wide smooth stretches of saltmarsh (*sabkhet*), dried by the sun into small blocks about 6 in. square. Here one frequently sees a mirage. In classical times the approach to Siwa was normally from Matruh, but in 526 B.C. Cambyses the Persian sent an army of 50,000 men from the south to occupy the oasis, and they disappeared completely in the vast area of sand-dunes that separate it from the Khargah oasis some 400 miles away. This may seem incredible, but it is not so to anyone who knows that country. Not a trace of the vast army has ever been discovered since.

The popular conception of an oasis, as a group of palms round a well, hardly applies to the five great oases of Western Egypt. The Libyan Desert is a huge empty plateau some 600 ft. above sea level, and each of the five great oases—including Siwa—is a large depression below sea level. Thus Siwa is surrounded by noble white cliffs about 700 ft. high. As a result, the climate, though on winter nights it may actually be frosty, is generally enervating, and the inhabitants are very different from the wiry Bedawin of the desert. Siwa has been aptly described as a land of lotus-eaters. The oasis, which is some 30 miles long and 15 wide, is full of luxuriant vegetation, especially date-palms and olives, but grapes grow in such profusion that they are wasted wholesale and every other sort of fruit and vegetable abounds. If the oasis were not so inaccessible the comparatively small area now cultivated could be profitably increased. The flat "floor" of the oasis is a natural kitchen-garden, which is irrigated from the apparently inexhaustible wells first dug in remote times and still in use. I had a most refreshing swim in one of the largest of these with the sheikh of Aghurmi (see p. 30), after lunching at his house in native fashion.



RUINS OF TEMPLE NEAR AGHURMI, SIWA OASIS.

THE MARKET-PLACE IN THE TOWN OF SIWA.

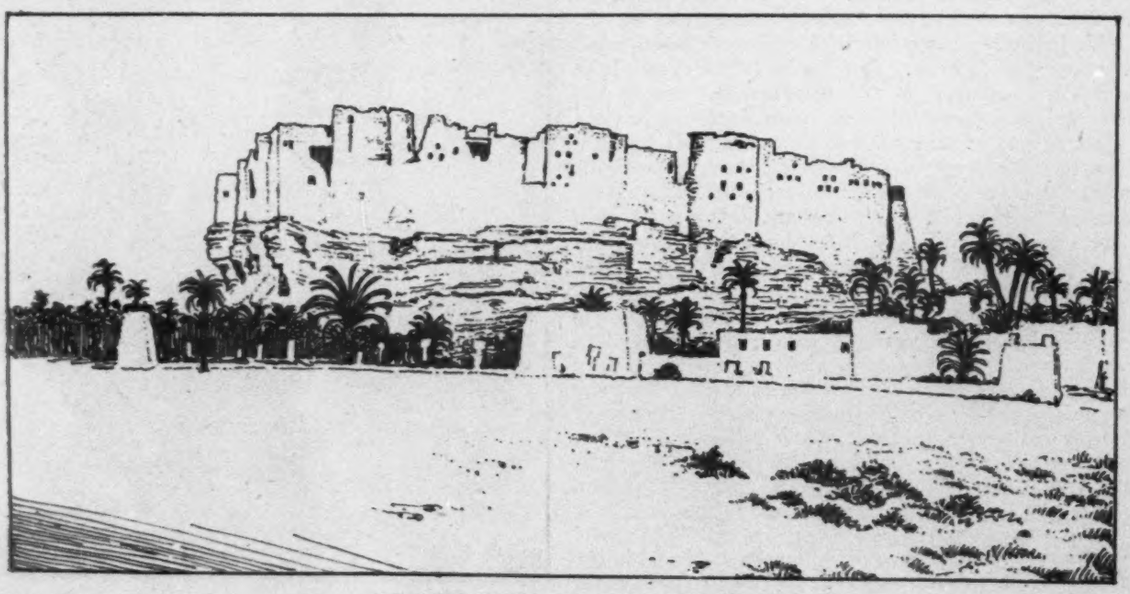
MODERN HOUSE NEAR THE TOWN OF SIWA.

Known as Ain al-Hammam, ("the bath well") to-day, its former name was *Fons Solis* and it is lined with Roman or older masonry. Its diameter is approximately 150 ft., its depth about 40 ft., and its water comes bubbling up from a sandstone stratum 400 ft. below ground level.

In the oasis there are two remarkable towns, in which a large proportion of the 4,000 inhabitants live, and smaller settlements of less interest. The town of Siwa itself, illustrated on page 27 from one of my photographs, is more characteristic of the Sahara than of anything in Egypt proper, *i.e.*, the Nile Valley and Delta. It has the appearance of a fortress or citadel, rising on an outcrop of natural rock, and is entirely built of mud and palm-trunks. The west end of this fortress consists of rock, but the eastern portion is all artificial and rises sheer above the market place. Externally it resembles some of the curious skyscraper-towns of mud illustrated in Freya Stark's books on Arabia; internally its structure suggests some gigantic honeycomb. The custom here has always been for each generation of each family to build a new "flat" on the top of their father's when he dies, in order to avoid a curse which otherwise would afflict them, so the strange building rises up and up until even the rashness of local craftsmen has to cry a halt. As in some of Le Corbusier's odd designs, the interior of the huge pile is quite dark; and one has to grope one's way up long, narrow, low, winding passages or ramps which take the place of staircases. The view of the oasis from the summit is, of course, superb. A mosque forms part of this extraordinary jumble of dwellings, but is distinguishable externally only by its tapered cylindrical minaret. Another of my photographs shows a modern house erected on the level "floor" of the oasis near the old town. Its "battered" walls are characteristic of Siwa and are the obvious result of building in mud. Strange to say, the sanitation of this amazing town is said to be excellent.

There are not, so far as I can ascertain, any historical buildings in the town itself, but near to it another rocky hill rises from the plain, known as Jebel Mutar ("The Hill of the Dead") or Qaret al-Musabarin ("The Hill of Stuffed Things"), which contains a great number of tomb-chambers, hewn out of the solid rock and said to be of the 4th century B.C. Most of them consist of a central chamber or succession of chambers, with smaller *loculi* or recesses for the reception of mummies. One of them, known in Siwa as the "Tomb of Artaxerxes," had just been opened when I visited the place in 1917, and I crawled into it to make a drawing of the crude paintings and hieroglyphs upon its walls (see page 29).

The fortress-town of Aghurmi is far more important historically than the town of Siwa, and lies some two miles east of it. As my sketch shows, it resembles Siwa town in appearance and construction, being built of mud and palm-trunks on an outcrop of rock. The minaret of its little mosque, also illustrated, is a curious and primitive tapered structure of stone, very different from the graceful mediæval minarets of Cairo. When the Egyptians conquered Siwa in the 6th century B.C., they found here on the acropolis of Aghurmi a temple dedicated to Jupiter Ammon which became famous all over the then known world. From far and near men came to consult its oracle.



THE FORTRESS-TOWN OF AGHURMI, SIWA OASIS.

Thus it happened, according to Herodotus (III, 17-26), that the Persian king, when he had invaded Egypt, sent his ill-fated army in 526 B.C. "against the Ammonians, with orders to carry the people into captivity and burn the oracle of Jupiter." The disaster that befell this army has already been described.

Within the town of Aghurmi there are two typical Egyptian doorways and a large piece of walling built into the natural rock-face. These fragments are said by Steindorff to represent the "Temple of the Oracle," and to date from the beginning of the fourth century B.C., only fifty years or so before Alexander the Great made a pilgrimage from Matruh to Siwa in 331 B.C., as narrated at some length by Plutarch. A recent writer states that this temple "appears to have consisted of a main building or sanctuary, surrounded by triple walls which enclosed the dwelling-places of the king, priests and guards, standing on a rocky eminence among the palm-groves. A smaller temple stood a few hundred yards south of the acropolis."

Up to 1837, a considerable portion of this small temple, known as "Omm Beyda," was still standing, and travellers of that date described its massive roof of stone blocks, its coloured ceilings, and its walls decorated with sculptures and hieroglyphs. But a Turkish governor, at the end of the 19th century, blew it up in order to obtain stone for the new *Markaz* (Government offices) at Siwa, and now all that remains is the interesting fragment of one of the pylons, shown in my sketch. Presumably explosives had to be used because of the cyclopean nature of the blocks of stone. Their size may be inferred from some of the great monoliths still remaining, which measure a yard square in section and from 30 to 35 ft. in length. The material is coarse sandstone, said to have been obtained from quarries two miles away. On these monoliths are carved various winged emblems and other subjects in bas-relief. The portion of the main wall still standing is similarly carved with figures and cartouches. Colour was plainly visible on the walls only a few years before I made my sketch in 1917.

Further information about Siwa and the Libyan coast, together with personal experiences, is to be found in my book *Through Egypt in Wartime* (published in 1918, and now long out of print). An excellent book, *Siwa*, by C. Dalrymple Belgrave (1923) gives a full description of the oasis and its people; and Ewart Falls' *Three Years in the Libyan Desert* (1913) not only describes the city of St. Menas but also shows the close interest taken by Germany in this part of Egypt just before the Four Years' War.

The present article may appear to be out of place at a time when "A.R.P." occupies the greater part of the space in all technical journals devoted to building. But the fact that, on the very day when I began this article, the newspapers announced that our War Minister had just returned from visits to Matruh and Siwa, proves that some topical interest attaches to these primitive and remote places in the Libyan Desert. It is to be hoped that they have escaped the worst horrors of war as we "civilised" people know it to-day.

EDITOR'S NOTE.—Mr. Briggs sends us for inclusion the following news reported by Reuter from Cairo on December 27 last: "Marshal Graziani has been giving 'valuable support' to the Egyptian Antiquities Department, in addition to providing Egypt with a macadamised coastal road and a partly constructed water pipe-line.

According to the newspaper *Al Ahram*, during a recent air raid in the vicinity of Siwa Oasis in the Libyan desert, a bomb crater uncovered some old buildings which proved to be ancient tombs.

As a result of this well-directed bomb, excavations will be begun and further important discoveries are expected to be made."

STANDARDISATION OF MATERIALS

INTERVIEW WITH MR. T. S. TAIT, DIRECTOR OF STANDARDISATION

THE belief that standardisation of building materials and equipment would lead not only to improved supplies and more economical production during time of war but to improved design of buildings both now and after the war was expressed by Mr. T. S. Tait, F.R.I.B.A., the newly appointed Director of Standardisation in the Department of the Controller of Building Materials, Ministry of Works and Buildings, in an interview with a representative of *The Builder*.

"Let me make it clear," he said, "that my job is in no way concerned with the replanning of London or any other part of Great Britain. My job is to ensure the necessary supplies of building materials for the Government Building Departments at lowest possible cost and with minimum delay.

"At present a large number of manufacturers are each turning out large numbers of designs for doors, windows, door furniture, and so on, which have little relation to one another. However permissible that may be in peace time, it is all against economical and speedy production just now when the putting out of action of a certain works producing, say, a special type of window could conceivably hold up the completion of an important Government contract.

Strength and Simplicity.

"To break up these many varieties of materials and equipment into a few standardised types is the essence of my work. A similar step from the point of view of existing stocks was recently undertaken by the then Office of Works in their publication 'War-time Building Supplies.' It is my aim, however, to establish certain standards which, besides the primary essentials of strength and toughness, shall have some architectural or æsthetic quality of which the keynote will be simplicity of design. This particular quality has been found to merge well with processing requirements, and the fears of those who believe that architectural quality will add to the production costs are unfounded. The reverse would be true."

Questioned as to the desirability of the Government giving some guarantee that production to new designs would be absorbed, Mr. Tait replied: "That is a point which, however desirable it might seem to be, I cannot answer. But production to a fewer number of designs should achieve much the same result by helping to overcome the regionalism in design which renders many materials and equipment unsuitable for use in other areas."

Replying to the question whether the fact that the War Office, the Admiralty, the Air Ministry and H.M.O.W. had all developed their own constructional methods and used special forms of equipment would not complicate simplification, Mr. Tait said that the problem here was undoubtedly a knotty one. "But all these departments," he added, "have (except in so far as their specialised construction is concerned) transferred their problems of standardisation to Lord Reith's Ministry, and we shall hope to establish some degree of standardisation in hutting and other buildings which will enable interchangeability of materials and equipment."

Standardisation and Post-War Design.

"Although it forms no part of my instructions," added Mr. Tait, "the effect of standardisation upon post-war buildings is much in my mind. That effect is likely to be good for architecture, as the keynote of all our designs will be simplicity and strength. These qualities are admirably suited to restrained architectural design and the use of sculpture, murals and colour in buildings.

"Moreover, the establishment of good standards of design will help in maintaining an improved level of design in speculative building, for I believe that when the time comes for post-war reconstruction the supply of trained architects will fall far short of the demand. Quite apart from bombed buildings, there will be the arrears of housing to be caught up.

"In such of this housing as is not architect-designed, good standard materials and fittings such as window-frames, doors, staircases, and so on, will go far to keep the builder on the right lines—much as books of architectural details such as the 'Builder's Jewel' helped in the production of much of Bloomsbury's fine buildings of a hundred years or more ago."

WAR-TIME BUILDING PRACTICE

By R. Cotterell Butler, A.R.I.B.A.

40.—SHELTERS AND SHELTER EQUIPMENT

CURRENT PROBLEMS AND COMMERCIAL DEVELOPMENTS REVIEWED

SURFACE SHELTERS OR "DEEP" SHELTERS?

Outside the technical Press considerable controversy has taken place over the official policy of the dispersal of populations of vulnerable or potentially vulnerable areas in surface shelters and strutted basements, designed to withstand the effects of blast and splinters of an arbitrarily selected intensity. The word "deep" is currently used to denote "safe" or "bomb-proof," but this, while being generally true, leads to an inaccuracy, since all too frequently "deep" shelters are contrasted with "surface" shelters, and the obvious fact that a *suitably constructed* surface shelter may offer equal protection to that afforded by an underground tunnel is overlooked.

Strictly speaking, the issue between surface and deep shelters is essentially a technical one—that is to say, the engineer and economic expert are the people best fitted to decide which of the two principles offers the greater degree of protection for a given economic outlay, within the framework of materials and labour put at their disposal.

However, if the value of technical training and experience is not to be wasted by abortive confusion with political issues, it must be realised that the technician—*as a technician*—is not concerned with the deciding of an appropriate degree of protection to meet a given situation. This is the job of the politician, accurately informed—it is hoped—by the economist and engineer of the degree of protection available for a given expenditure.

It must, therefore, be understood that in reviewing and discussing questions involving comparisons between shelters offering widely differing degrees of protection, each case is being considered solely on its technical merits of economy and practicability, and that no suggestion is being made of whether or not the degree of protection afforded in any one instance is adequate for current requirements, or that the official shelter policy is either adequate or inadequate for present conditions.

UNIT SHELTERS OR MASS SHELTERS?

The relative degrees of protection afforded from high explosive bombing by unit and mass shelters respectively vary considerably, of course, with the actual structural protection provided against the effects of the H.E. bomb. the intensity and nature of the bombing and other factors.

As far as protection from high explosives is concerned, one may assume that technically where the structure of the shelter approaches 100 per cent. direct hit resistance, mass shelters are likely to be the more practicable, and where it approaches zero, unit shelters offer greater degree of population protection.

INFECTIOUS DISEASES

Conditions of modern warfare, involving intense and continuous nervous strain and in most cases a reduced consumption of body-building and "protective" foods, inevitably lower resistance to disease. Similarly, exposure to cold and damp, overcrowding and defective sanitation, all contribute towards a greater prevalence of epidemics.

At this time of the year bodily resistance is, on the whole, lower than during the summer months, and it is particularly topical to consider the effects of shelter design and equipment on the incidence and spread of disease. Although the peak period of lowered vitality is almost here already, and it might be said to be too late to consider the question of prevention for "this season," it must not be forgotten that unlike under peace conditions resistance to disease may continue to fall as the war continues and even be accelerated by hot weather next summer.

It would seem to be necessary for the populations of the majority of our large cities to spend at least a considerable part of each 24-hour-day in shelter, often during the time when bodily resistance is most lowered by fatigue resulting from the day's work. The adoption of suitable principles of shelter design to minimise both the occurrence and spread of disease may well, in the course of time, become almost as important a design consideration as providing protection against attacks with H.E. bombs.

The main factors involved in preventing the occurrence and spread of disease among persons taking shelter may be summarised as follows:

A. PREVENTION OF SPREAD OF INFECTION FROM CHRONIC SUFFERERS FROM INFECTIOUS DISEASES.—Even where amenities are such that shelterers may experience the same standards of comfort as, say, when travelling by tube or train in peace time, lowered vitality, nervous tension and the general strain of war conditions make the contraction of such diseases as tuberculosis by persons sharing the same accommodation as others a considerably increased possibility. Apart from the first essential—that of providing suitable ventilation, sanitation and heating and lighting in shelters—it would appear a most reasonable precaution to provide either group shelters to be used by tuberculous families, or, where the dispersal principle is generally adopted, to provide individual family shelters for such persons.

B. PREVENTION OF CONDITIONS PROMOTING INFECTIOUS DISEASES.—Quite apart from the question of infectious diseases spreading through the overcrowding of persons in shelters, shelter conditions may themselves be the primary cause of the development of a serious epidemic, both by providing suitable conditions for the propagation of the diseases and by lowering the individual's resistance to infection.

Damp, poor ventilation, or overcrowding (overcrowding in the shelter sense and poor ventilation amount to practically the same thing) and the absence of satisfactory sanitary arrangements all provide opportunities for dormant germs to become super-active in the bodies of others than those upon whom they were housed.

C. PREVENTION OF CONDITIONS WHICH WOULD MAKE THE CONTROL OF DISEASE DIFFICULT OR IMPOSSIBLE, AND THEREFORE ENCOURAGE EPIDEMICS.*—In order that these may be avoided, adequate sanitation and ventilation facilities in all mass shelters are, of course, essential, and while ventilation is less likely to be a difficulty in the smaller type of unit shelter, the provision of suitable emergency sanitary accommodation is every bit as essential.

Similarly, provision should be made for the isolation of suspected persons, but this matter (apart from the fact that the benefits of isolation become less as size of the shelter increases) is one rather of organisation than accommodation.

War-time commercial developments over the past year have done much to make practicable the construction of shelters of many types, suitably equipped to provide amenities which may do much to prevent the conditions mentioned above from developing. However, before discussing these in detail, it is perhaps as well to consider what effects the respective principles of mass and unit shelter systems may have on the solution of these problems.

At first sight it might appear that the dispersal system using small family unit shelters would be the one most likely to prevent the spread and development of infectious diseases. While it is not possible to consider all the varying

* The possibility of bacterial warfare, however remote, should not be ignored.

factors involved, such as types of disease, local conditions, and so forth, it is quite clear that the dispersal system is by no means necessarily the better.

The provision of heating, ventilation and sanitary services for each and every individual shelter of a similar standard to that obtainable in large mass shelters is not only less practicable but is certainly less economically satisfactory. Again, poorly serviced unit shelters are all too likely to act simply as incubators for disease, spread of the infections thus developed taking place during the course of normal business life.

Finally, one of the first fundamentals of the control of the spread and general development of epidemics is a public health service operating smoothly and effectively. Obviously this may more easily be carried out as part of mass shelter organisation than by attempting to link-up individual groups under raid conditions.

This disadvantage of the mass shelter compared with the individual unit would appear to be that no matter how well it be planned, organised, and equipped, the size of the group of suspects after the discovery of a case of an infectious disease would tend to be very much greater than in the case of individual shelter systems. Without attempting to go deeply into the medical side of the problem, it might appear reasonable to assume that this disadvantage might be overcome to some extent in the case of certain diseases by segregation within the mass shelters.

Similarly, normal domestic cooking arrangements may not so easily be co-ordinated with mass shelter facilities, and, in addition, the unit shelter in or near to the normal dwelling would save much unnecessary time being spent in shelter, or delay in getting there where raids were spasmodic and necessitated varying arrangements.

To summarise these points it would seem probable that—

(*a*) Where it is a choice between an unsatisfactory unit shelter and an equally unsatisfactory mass one, the unit shelter would be the better.

(*b*) That "isolation shelters," either group or family type, would appear desirable for tuberculous and similar persons.

(*c*) That where it is possible to arrange for *definitely satisfactory* equipment in unit shelters, these are generally preferable (from the point of view of epidemics).

HEATING AND VENTILATION

The problems of heating and ventilation are very closely related in connection with the provision of these amenities for shelters. As with most other services, economical heating and ventilation of a satisfactory standard of efficiency is usually more difficult to obtain for many unit shelters than for an equivalent mass shelter.

In the large communal shelter, heating and ventilation problems are much the same as for an auditorium, and the principles involved are well understood. One of the most interesting aspects to be taken into consideration is the actual heating effect provided by the bodies of the shelterers, and that where the number of shelterers for a given area is high (even neglecting what might be called overcrowding) mechanical air cooling may sometimes have to be arranged.

To meet the dangers of damaged supply services causing breakdowns in the ventilation arrangements, manually operated emergency equipment has now been marketed. Usually operated by hand or foot, this is capable of supplying sufficient air changes completely to prevent any danger of defective ventilation.

The unit shelter will not normally be expected to require mechanical ventilation, but some means of allowing the carbon dioxide from exhaled breath to escape must be provided. Light- and splinter-proof baffle ventilators are now marketed which will provide suitable ventilation with a standard of resistance to splinter penetration equal to that of a "code" wall. Adequate ventilation is of course important at all times, but this is even more the case where a heating system which is at all suspect is being used.

The products of well-regulated combustion are for the most part carbon dioxide, a gas which while non-poisonous as such nevertheless will not support respiration. Ill-regulated combustion frequently results in the production of carbon monoxide, which is most definitely a lethal gas, and only heating systems which preclude production of this gas on anything but a negligible scale should be approved.

A number of types of small stove burning solid fuel and suitable for the domestic size of shelter are now marketed. Their design makes them more or less foolproof, but some form of ventilation should always be arranged, and the fitting of the flue pipe should be most carefully carried out.

All combustion consumes oxygen, and in shelters where accommodation is crowded, every endeavour should be made to use a heating system which does not use up valuable air. An electric heater, provided the supply installation is carefully arranged, *and is not of the exposed element type*, is satisfactory from this point of view. A simple alternative would be to use a small outside boiler and heating pipes, or small radiator such as is frequently used for garden frames and greenhouses. With this arrangement no danger from flue gases or electric power would be present.

LIGHTING

The provision of suitable lighting for the larger types of shelter may be said to have been solved already. Equipment designed to work off normal electric supply services, with all necessary safeguards to obviate danger should the system be damaged while in operation, and equipped with manually operated generators for use should the supply fail, is already marketed.

Other means of alternative lighting by the use of oil lamps designed to be used in emergency are obtainable. Recently, extremely well-designed lamp units for operation on oil have been marketed—units which, being both efficient and attractive, may well be even more widely used after the war.

Lighting for the unit type of shelter is rather more of a problem. As far as emergency installations are concerned, the oil lamps already mentioned are quite suitable, their flame temperature is low, and, being robust, little danger is attached to their being knocked over or otherwise upset in an emergency. The general difficulty is that while these emergency lamps are certainly admirable for the purpose for which they are designed, their illuminating power cannot be said to be sufficient to provide satisfactory reading conditions. Considerable danger is attached to the use of the usual type of domestic oil lamp, which is easily turned over and set on fire, and in any case uses up a considerable amount of valuable oxygen. The ideal form of shelter lighting for normal purposes is obviously electric power, provided the installation is properly carried out and provided with all necessary safety devices. The danger of a temporary "hook up" bringing high voltage power into a sub-surface shelter cannot be stressed too highly. Most domestic shelters are either damp or inclined to be damp, they are usually in direct contact with the earth, and in some cases made of earthed metal.

It requires no great feat of imagination to appreciate the electrical continuity which could occur between a damaged switch box or cable and a person in contact with the supply potential at this point, and standing either on an earthed metal plate or, what is almost as bad, a water-saturated floor of brick, concrete or timber.

The most satisfactory form of lighting for a small shelter would seem to be an individual electric lighting system. This could consist of a six- or twelve-volt automobile battery type, feeding a 24 watt lamp for reading, and a 6 watt or less for emergency purposes. The drain on such a supply could easily be made good by keeping the batteries on charge during the day by an inexpensive trickle charger. There would *be absolutely no danger from the use of a low potential storage battery supply, of the order of six to twelve volts.*

DAMP-PROOFING

It is probably quite true to say that almost all home-constructed shelters suffer either from severe condensation or actual moisture penetration through the walls and/or floors. Equally, a surprising number of shelters constructed by skilled labour are by no means damp-proof. This has usually been due not to any faulty workmanship, but simply to the fact that no damp-proofing measures were taken at the time of construction.

There are no insuperable difficulties in the way of making a below-ground unit shelter thoroughly waterproof. The main reason why many shelter schemes have not included proper waterproofing would seem to be that the cost of so doing is far from negligible, and that at the time of construction attention was primarily directed towards the provision of some measure of bomb protection as hastily as possible.

Experience will surely have taught the folly of constructing sub-surface shelters without waterproofing, particularly if it is realised that there are no technical difficulties in obtaining water-resisting structures *at the time of construction*.

There is no need to reiterate in detail the many admirable ways to waterproof a structure at the time of construction, by using a waterproof membrane in the form of a sandwich, by tanking with a suitable mastic, by rendering with a water-resisting cement composition, or by integrally waterproofing the material of which the shelter is built. Many people—some of whom should have realised it before—are now appreciating the difficulties of waterproofing a structure *after* it has been constructed. This may be done by internal rendering with a waterproofing mortar, by treating the existing structure as an outer skin and building up a new inner wall or floor, with a membrane or mastic layer between the new wall and the old.

It must be stressed that waterproofing at the time of construction is both less expensive and more satisfactory, that hydrostatic pressures can impose severe strain on structures, and that a poorly-made internal rendering may be rapidly forced from the remainder of the structure by this pressure.

SANITATION

Proper sanitary arrangements are an absolutely essential element in the servicing of large shelters if the development and spread of infection is to be avoided. The larger the scheme the greater is the possibility of an efficient system being economically obtainable. This is particularly the case where the shelter level is below that of the main sanitation line, and some automatic mechanical means of raising the soil water has to be provided. It would not seem desirable to encourage arrangements whereby the sanitation units were at a higher level than the normal protected area, as reluctance to use the facilities thus provided might thereby be encouraged.

Only by the most scrupulously clean habits and careful disposal of soil can insanitary conditions be avoided in unit shelters. This is particularly important where families include children or invalid persons. Transportable sanitation units, making use of highly efficient disinfectants, are being marketed in increasing numbers, and the use of these combined with organisation and personal cleanliness can do much to bring the standard of hygiene in the family unit up to that of the fully serviced communal shelter.

SLEEPING ACCOMMODATION

The problem of providing some form of sleeping accommodation for use where it has or is likely to become necessary for long periods to be spent in shelter has been partly met by the production of two- and three-tier bunks either of the unit type or designed to be fitted to shelter walls where these are suitable. Well-designed light metal units of both types, produced most economically and efficiently by up-to-date mass-production methods, are now on the market, and are available in such quantities as material supplies make possible. Certain types of bunks are provided with built-up wire mattresses, which are not only rot-proof and non-inflammable, but in addition most hygienic and easily cleaned —particularly important considerations. If the provision of suitable bunks were the only factor, the vast majority of municipalities would be in a reasonable position to provide adequate sleeping facilities. However, the problem of providing bunks is by no means the only one. Many shelter types are quite unsuitable for sleeping in, both by reason of their resistance to damp and their lack of suitable heating and ventilation services.

INCREASING STANDARDS OF PROTECTION

Generally speaking, little can be done without disproportionate expenditure to increase the "direct hit resistance" of a surface shelter of the "code type" to anything but bombs of a very light calibre.

Beyond providing protection against the overturning moment of the blast wave by structural rigidity and the penetration of splinters by adequate wall thickness, the addition of further protective layers may be said only to reduce the radius within which a bomb must detonate in order to constitute a direct hit.

Such steps are, of course, worth while, since reducing the radius of the circle within which the bomb must fall to cause serious damage increases the chances of the shelter being "missed."

The production of well-designed proprietary fittings for shelters such as emergency exits, splinter-resisting ventilators, etc., has considerably eliminated the need for weak spots in a shelter's protective shell. Shelters constructed before such devices were available and having unsatisfactory emergency exits, ventilators and so forth, may be considerably improved by the addition of these up-to-date fittings.

(*To be continued.*)

CORRESPONDENCE

Facsimile Reconstruction.

To the Editor of *The Builder*.

Sir,—I read Mr. Max Tetlow's letter on this subject, in a recent issue, with considerable misgivings, knowing that it expresses a plausible opinion which will appeal to a good many people who have not yet fully weighed the consequences. These misgivings would be less pressing if we could feel with any confidence that we are living in an age of artists whom we could trust to write contemporary history in brick and stone in terms of which we could feel proud.

Even were that the case, I should still view with much reluctance the prospect of so surrendering to the rape of our art treasures by acquiescing in their loss for all time; but having lived through twenty years or so of complete architectural chaos, there seems to me to be no question about the proper course to adopt, which is to obliterate the foul work of the invader as quickly as possible by building up afresh the things he has destroyed, except the slums and squalor, of which we are well rid.

This is not a matter of reproducing the antique, for there can be no pleasure or profit in that. St. Pancras Church never contributed to London the spirit of the Erectheion, nor was the sight of the Mausoleum of Halicarnassus perched upon a Bloomsbury tower ever edifying. But that is a very different thing from making Coventry Cathedral, St. Bride's, and the like, rise from the dust and ashes like the Phœnix. These things we cannot do without, and we have no right to steal their sites for less worthy buildings, as those of to-day seem, alas, doomed to be.

After all, there is nothing so dead and lifeless about the process. The work of the architect is born in his mind's eye, and his vision is materialised by a team of craftsmen. Why should not the same vision be re-created by another team no less skilful? The architects of to-day will best show their feeling for Art by following the humbler but equally skilful course of reproduction, and they will find full scope for their creative spirit among those crooked streets and squalid buildings which have for too long cried shame to the Victorian age.

G. Maxwell Aylwin.

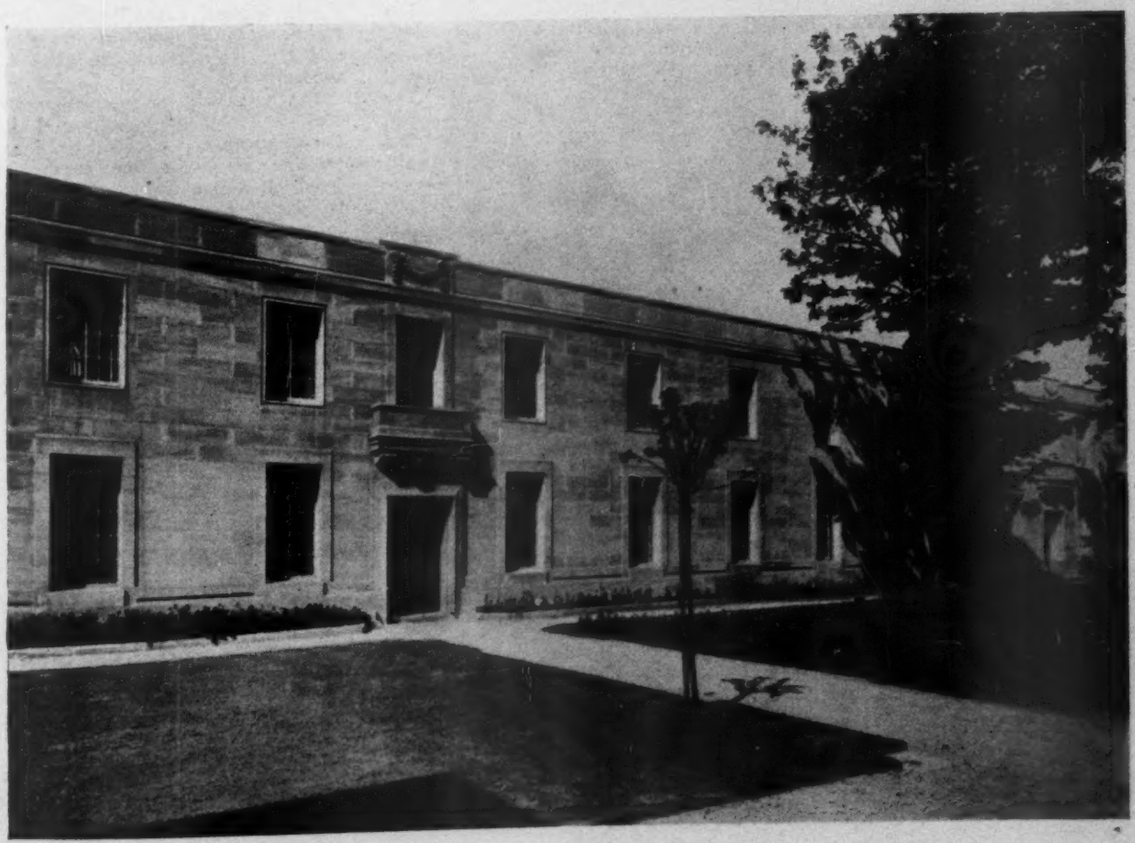
Farnham, Surrey.

REGENT'S PARK COLLEGE, OXFORD

MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.

Right: TEMPORARY ENTRANCE FROM PUSEY STREET.

Below: NORTH BLOCK FROM THE SOUTH.



REGENT'S PARK COLLEGE, OXFORD.

THE SENIOR COMMON ROOM.

THE site of the new Regent's Park College, Oxford (the Baptist College) is in St. Giles's, on the north side of Pusey-street. The complete scheme will consist of four sections: (1) the western section, containing hall with service rooms, tutorial and lecture rooms, seminars and library; (2) and (3) the northern and southern blocks, each containing sets of undergraduates' rooms; and (4) the east block, which will have a frontage to St. Giles's, and will contain the main entrance, porter's lodge, bursar's office, etc.; with chapel over, flanked by a house for the principal or resident tutor, and other rooms for general administrative purposes.

In the meantime, the west and north blocks only have been completed, with a temporary entrance in Pusey-street. The west block, of which the most important feature is the hall on the ground floor, is reached both from the quadrangle and from Pusey-street, so that it may be used for external lectures without disturbing the routine of the college. To the north of the hall are the usual service rooms.

The main staircase, rising from the hall, leads to two seminar libraries on the first floor and the small gallery to the hall. The main library is on the second floor, together with librarian's and catalogue rooms, and also the Angus Library, which contains a particularly valuable collection of theological books. The senior common room and junior common room are on the east side of the main block, south and north respectively.

A temporary chapel, air-raid shelter and store are placed in the basement at the south end, and at the north end is the heating chamber and additional store-rooms.

The north block contains 16 sets of undergraduates' rooms, on two floors, with two common entrances and stairs. Each undergraduate is provided with a bed-sitting room. A room for the storing of suitcases, making of tea, etc., is provided on each floor, also ablution rooms and scout's pantry. The main lavatories, drying room, etc., are in the basement of this block.

The building throughout has been erected in Clipsham stone. The floors generally, with the exception of the undergraduates' rooms, are of wood block. The floors to these rooms (*i.e.*, undergraduates') are of linoleum, laid direct on concrete. The walls dividing the undergraduates' rooms and the rooms from the corridor are of two thicknesses of "Gypclyth," to prevent the passage of sound. All doors and other furnishings throughout are of oak, and the windows are steel casements.

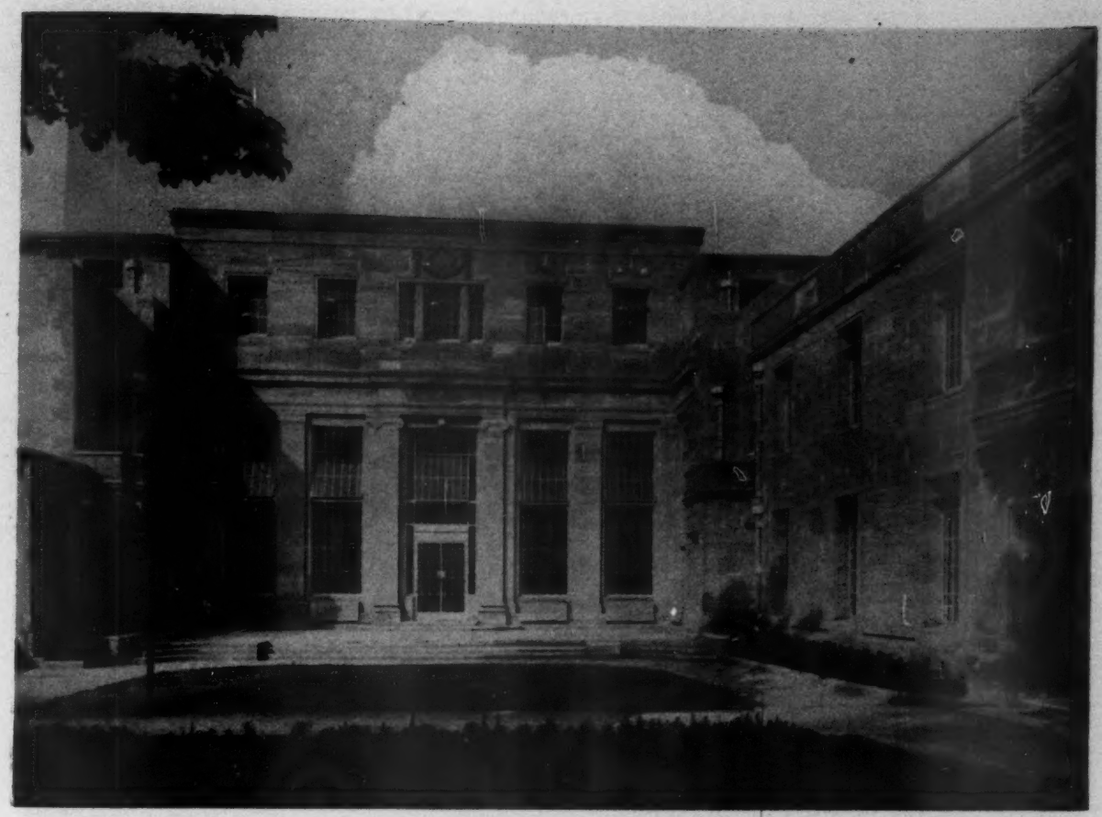
The present "quad." will be enlarged when the north and east blocks are erected. As many as possible of the existing trees have been retained, and these will not be disturbed by the future development of the site.

The architect is Mr. T. Harold Hughes, A.R.C.A., F.R.I.B.A., F.S.I. Messrs. John Dansken and Purdie were the quantity surveyors and Mr. Harry Cope the clerk of works.

The general contractors were Messrs. Wooldridge & Simpson, Ltd., Frenchay-road, Oxford. Sub-contractors were: heating engineers, Fred. G. Alden, Ltd., Oxford; electrical engineers, Lowe & Oliver, Oxford; metal windows, John H. Pye, Ltd., Moreton-in-Marsh, Glos.; flooring contractors, A. M. Macdougall & Son, Ltd., Glasgow, C.2; bronze metal work, Bromsgrove Guild, Ltd., Bromsgrove; electric fittings, Osler & Faraday, Ltd., Glasgow, C.2; sanitary fittings, Shanks & Co., Ltd., Glasgow, C.2; clocks, T. S. Cuthbert, Glasgow; and furniture, Greenings (Oxford), Ltd., Oxford.

AN UNDERGRADUATE'S BED-SITTING ROOM.

MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.

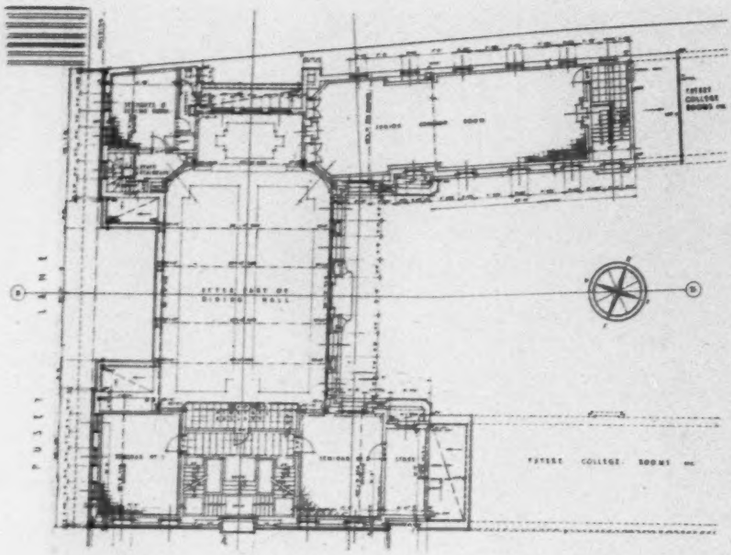


THE HELWYS HALL WITH LIBRARY OVER. FROM THE EAST.

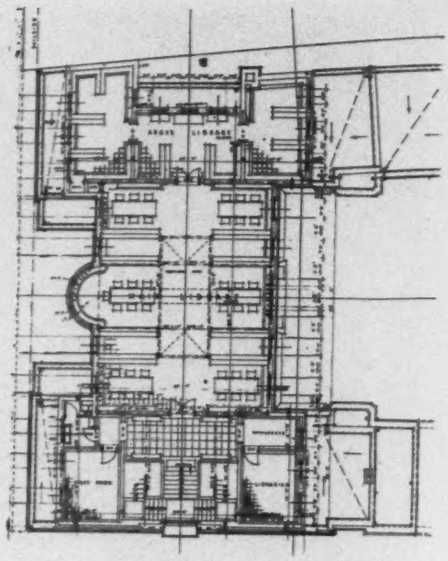
Right : ENTRANCE TO HALL FROM PUSEY STREET.

REGENT'S PARK COLLEGE, OXFORD.

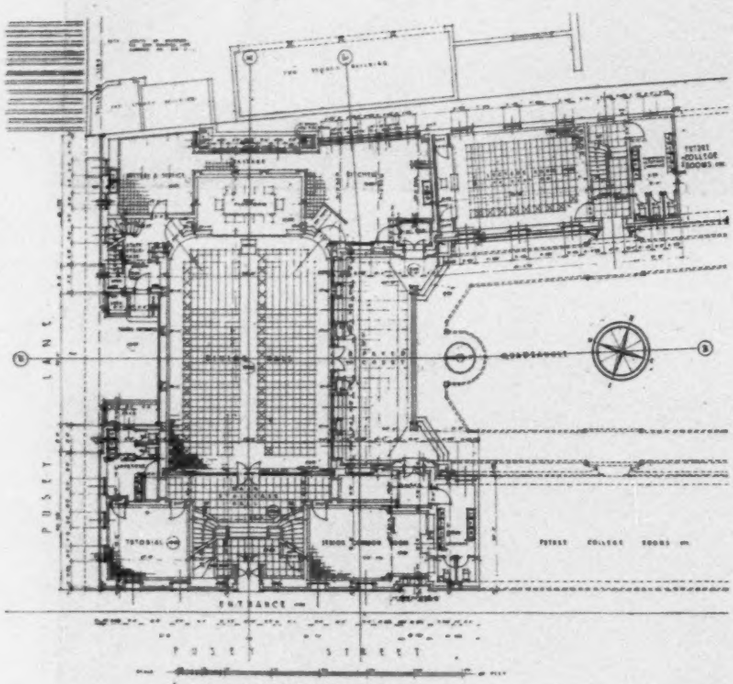
MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.



FIRST-FLOOR PLAN.



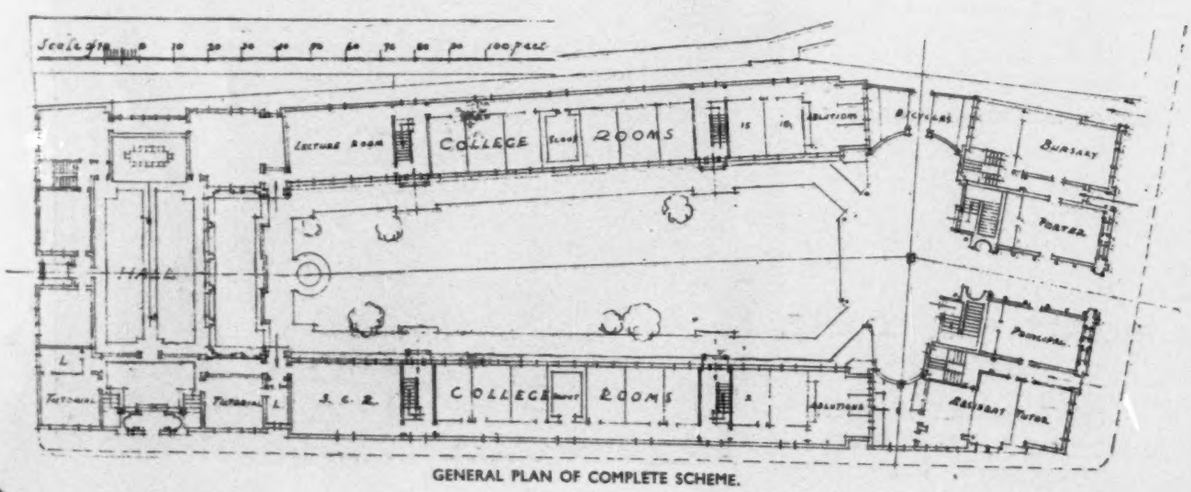
SECOND-FLOOR PLAN.



GROUND-FLOOR PLAN.

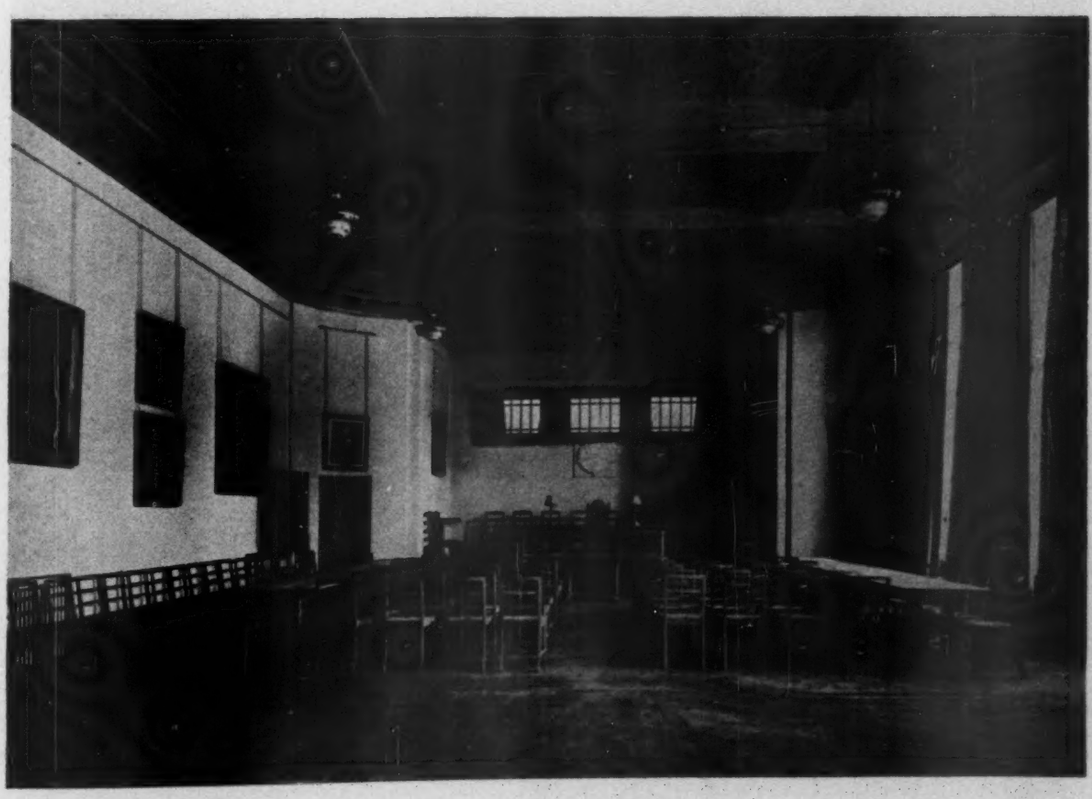
REGENT'S PARK COLLEGE, OXFORD.

MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.



GENERAL PLAN OF COMPLETE SCHEME.

THE STAIRCASE. *Below* : THE HELWYS HALL.



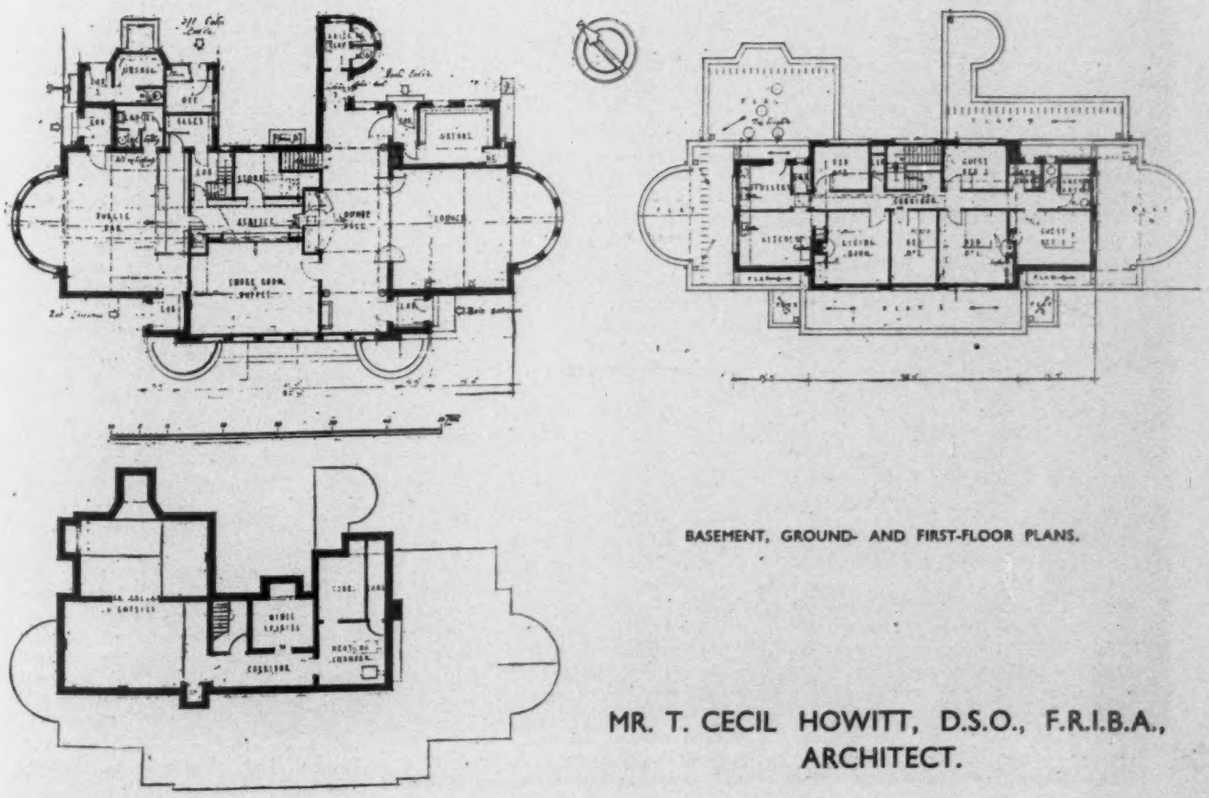
REGENT'S PARK COLLEGE, OXFORD. MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.

THE LIBRARY. *Below :* JUNIOR COMMON ROOM.

REGENT'S PARK COLLEGE, OXFORD. MR. T. HAROLD HUGHES, F.R.I.B.A., ARCHITECT.

THE PRINCIPAL FRONT.

THE VALE HOTEL, DAYBROOK, NOTTS.



BASEMENT, GROUND- AND FIRST-FLOOR PLANS.

MR. T. CECIL HOWITT, D.S.O., F.R.I.B.A., ARCHITECT.

MR. T. CECIL HOWITT, D.S.O., F.R.I.B.A., ARCHITECT.

THE SMOKE ROOM AND BUFFET.

THE VALE HOTEL, DAYBROOK, NOTTS.

THE Vale Hotel commands the northern main approach to the city of Nottingham, on a corner site adjoining the Sherwood Municipal Housing Estate development and in immediate proximity to the shopping centre of this estate.

The environment of domesticity has been expressed in the underlying principles of the design. The plan has been articulated on the ground floor around the main service element with spaciousness, the lounge hall dominating the smoke-room buffet and lounge, the latter balancing the public bar with separate entrance and large semi-circular bay. A small off-licence sale shop has been introduced, with observation window to the service quarters.

The first floor forms a self-contained flat, the residence of the tenant, with annexe for two guest-rooms and necessary dissociated offices. Access to the flat is achieved by staircase directly from the lounge hall. The basement is naturally laid out to accommodate the cellars and stores commensurate with this type of business, with heating chamber for the central heating system of the building.

The elevations have been constructed with small grey sandstock bricks terminating at parapet walls with tiled roofs hipped and steeply pitched. The fenestration takes the form of closely grouped units to the full height of rooms from skirting level. The windows are of the steel casement type, subdivided with steel bars into proportion horizontally disposed.

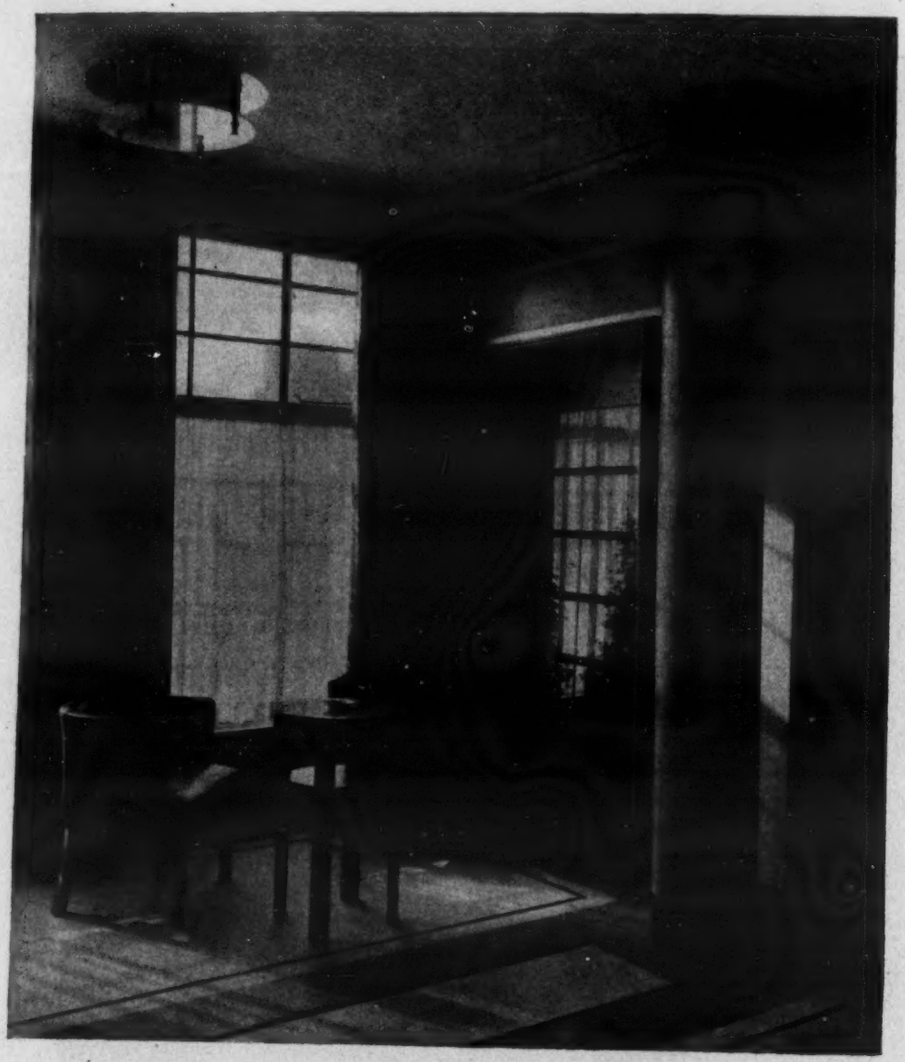
Finishings and equipment, counters, etc., have been carried out simply and in style of a character similar to that which distinguishes the main lines of the design.

Low parapet walls of broad dimensions in brick, stone-capped, and giving central flower-beds, form the boundary wall adjoining the pavement, with dwarf-circular pedestals flanking the points of ingress. The interior of the site is developed with car-parking facilities, lawns and paths. A carefully designed inn signpost has been erected in a position central to the main façade, which has been carried out in a manner worthy of the traditions of this craft.

Messrs. H. Hofton & Son, Ltd., Regent-street, Beeston, were the general contractors. Sub-contractors and suppliers were: Crittall Manufacturing Co., Leicester, steel casements; G. Sands & Son, Ltd., Colwick, Notts, steelwork; Trent Concrete Co., Ltd., Colwick, Notts, cast stonework; Helical Bar and Engineering Co., Ltd., London, S.W.1, hollow-tile floors; Young, Austen & Young, Ltd., Nottingham, heating and ventilation; J. A. King & Co., Ltd., London, pavement lights; Doulton & Co., Ltd., Dudley, sanitary fittings; General Electric Co., Ltd., Birmingham, "Neon" work; J. Avery & Co., Ltd., London, sun blinds; Luxfer, Ltd., London, dome lights; W. J. Furse & Co., Ltd., Nottingham, electrical installation; Cork Insulation Co., Ltd., London, cork flooring; Carter & Co., Ltd., Poole, wall and floor tiling; Hudson, Dodsworth & Co., Ltd., Manchester, beer-pump and fittings; Williams (Shopfitters), Ltd., Nottingham, "Vitrolite" wall linings to Off-Sales Department; Gaskell & Chambers, Ltd., Nottingham, stainless steel drainers; Henry Barker, Ltd., Nottingham, linoleum; Daymonds, Ltd., London, W.1, plastic lettering; Fitchett & Woollacott, Ltd., Nottingham, teak-block flooring; Samuel Harvey, Nottingham, garden work; G. T. Rackstraw, Ltd., Worcester, specialist joinery; Lewis & Grundy, Ltd., Nottingham, ironmongery; H. H. Martyn & Co., Ltd., Cheltenham, hotel sign; Morris-Singer Co., S.W.8, bronze lettering; London Sand Blast Decorative Glass Works, E.3, plate-glass screens; Best & Lloyd, Ltd., Birmingham, 21, lanterns; Gent & Co., Ltd., Leicester, electric clocks; Smart & Brown, Ltd., Nottingham, rubber flooring.

THE LOUNGE. *Below*: THE PUBLIC BAR.

THE VALE HOTEL, DAYBROOK, NOTTS. MR. T. CECIL HOWITT, D.S.O., F.R.I.B.A., ARCHITECT



CORNER OF LOUNGE HALL.

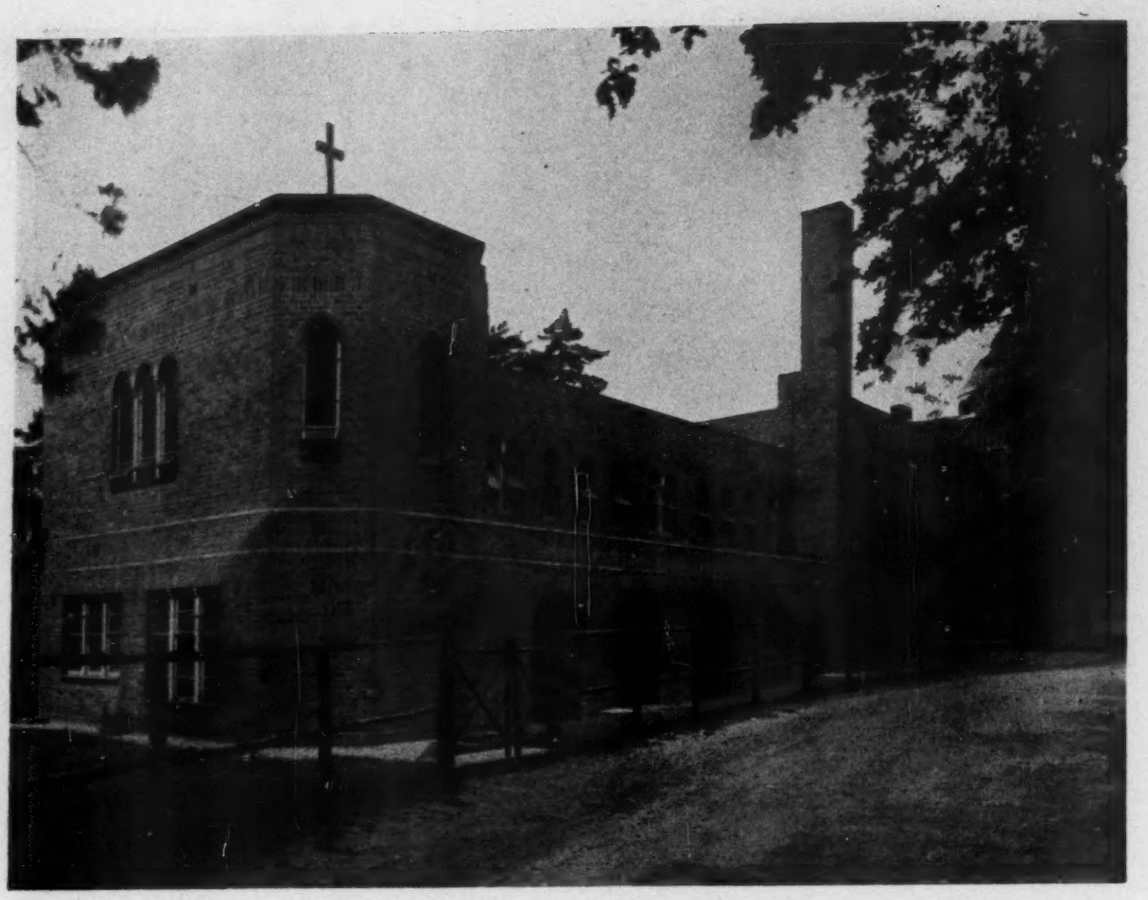
THE LOUNGE HALL.

THE VALE HOTEL, DAYBROOK, NOTTS. MR. T. CECIL HOWITT, D.S.O., F.R.I.B.A., ARCHITECT.

VIEW OF WARDS FROM WEST. *Below* : THE SICK WARD.

EXTENSIONS TO A CONVENT, EDGWARE.

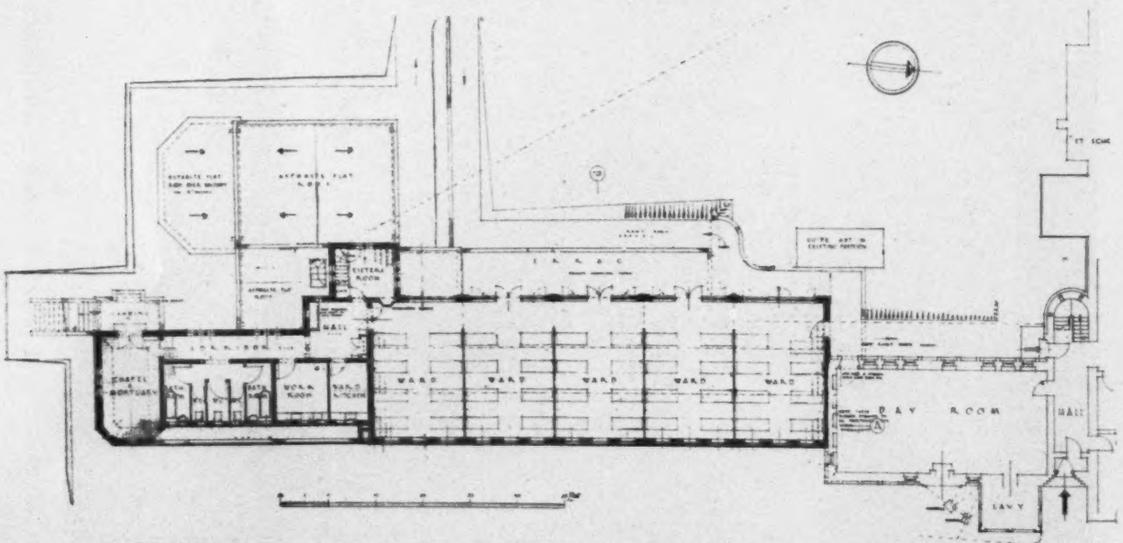
MESSRS. COLLCUTT & HAMP, ARCHITECTS.



VIEW FROM SOUTH-EAST, SHOWING MORTUARY CHAPEL.

The extension to the existing Convent of St. Mary at the Cross, Edgware, comprises a new ward block for inmates with a separate sick ward for bed cases. In addition there are the necessary offices with a small surgery. A feature is made of the small mortuary chapel, in which use was made of stained glass and floor-tiling from the original convent building formerly occupied in London. The buildings are faced with hand-made sand-faced bricks, with cast-stone dressings, the roof of the mortuary chapel being covered with copper.

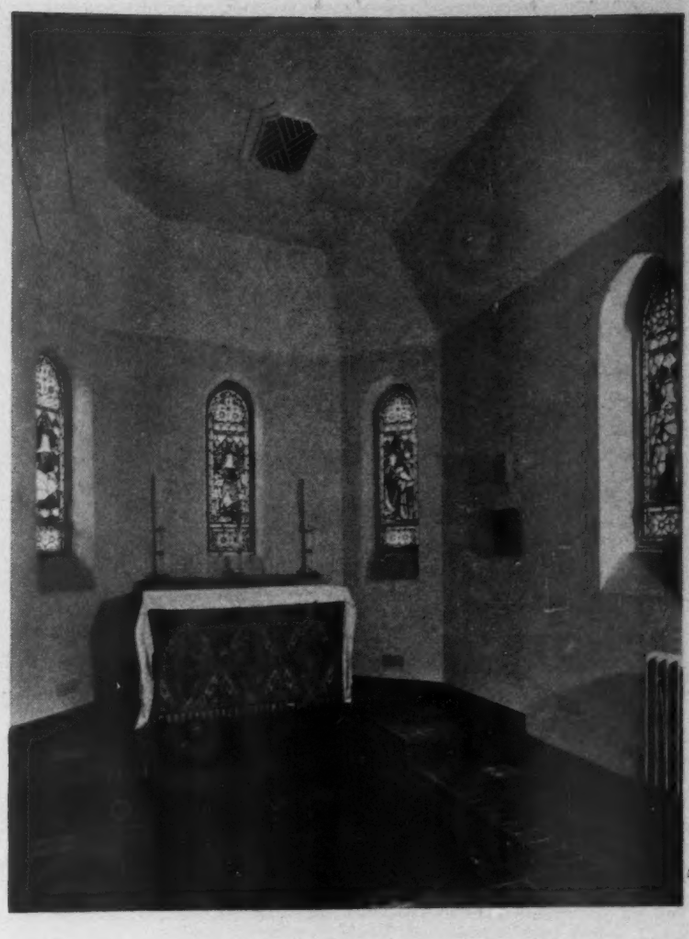
The general contractors for the work were Messrs. Boyd & Murley, of Reading. The sub-contractors engaged were: G. N. Haden, Ltd., heating and hot water; Crittalls, steel windows and ward screens; Arthur Cozens, electric light and power; Scull & Son, plumbing and cold water; Bradford & Co., hollow-tile floors; Hollis Bros., floors; Pontifex & Emanuel, sanitary fittings; Rubery, Owen & Co., steelwork; and Ewart & Co., copper roofing.



EXTENSIONS TO A CONVENT, EDGWARE. MESSRS. COLLCUTT & HAMP, ARCHITECTS.

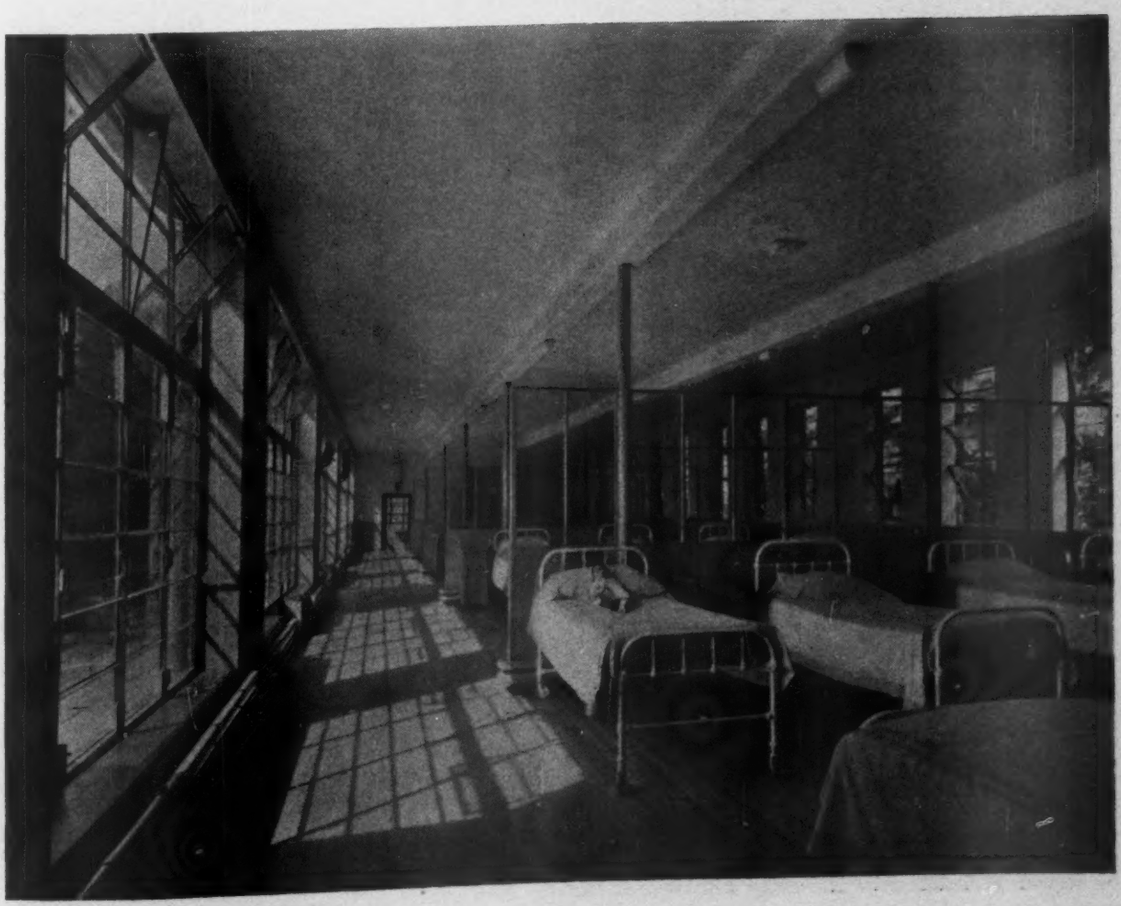
EXTENSIONS TO A CONVENT, EDGWARE.

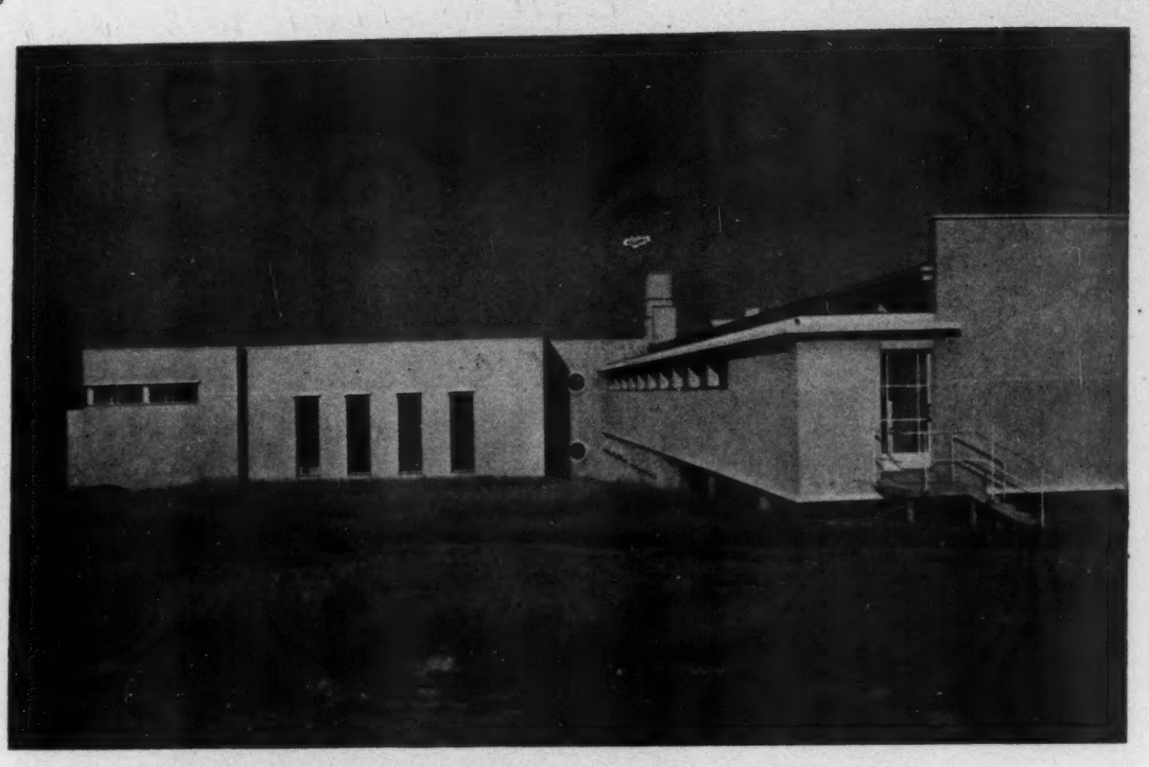
MESSRS. COLLCUTT & HAMP, ARCHITECTS.



Right : VIEW OF ALTAR IN MORTUARY CHAPEL.

Below : INTERIOR OF WARD BLOCK





VIEW SHOWING ASSEMBLY HALL WITH CLASSROOM CORRIDOR IN FOREGROUND.

ECCLESFIELD TOWN SENIOR SCHOOL

SIR JOHN BURNET, TAIT & LORNE, ARCHITECTS.

MR. FREDERICK MACMANUS, A.R.I.B.A., ASSISTANT IN CHARGE.

SITE: The site, which is about 10½ acres in area, is situated off the High-street.

The school buildings—which will accommodate 280 children, boys and girls, together with the paved playpitches—occupy one acre of the site. The remainder will be laid out as playing-fields.

PLAN: The buildings have been placed towards the north of the site, in order that the rooms should face the sunny aspect and overlook, as much as possible, the school's own grounds. The buildings have been designed in two main wings, the classroom wing facing south-east, and the special subjects room wing facing south-west. Owing to the slope of the ground the teaching accommodation has been planned on one level clear of the ground.

In the space under the classroom wing, which runs against the slope of the ground, the staff accommodation has been provided, and in the larger space under the special subjects room, which runs with the level of the ground, has been placed the pupils' entrance, cloakrooms, lavatories and covered play-space.

This arrangement provides direct access to the pupils' lavatories and cloaks, both from their entrances and from the playpitch. The gymnasium, with its changing-rooms and shower baths, is placed at the south end of this wing.

The assembly hall is placed on the ground floor at the junction of the two main wings, with the main entrance hall forming the link between them. This arrangement is such that the assembly hall can be used independently of ordinary school purposes, as a social centre in the evenings, and the entrance hall can be used for the exhibition of craft work.

A kitchen adjoins the assembly hall, from which about fifty children, who come from a distance, will be served with dinners. The stage will be used for the dining-space in order to avoid the necessity of moving the assembly hall seating each day. The buildings have been designed to obtain the maximum light and air to all the teaching rooms, large windows being provided on the sunny side and the corridor

VIEW SHOWING MAIN ENTRANCE. THE ASSEMBLY HALL IS ON THE RIGHT.

1

2

ceilings kept low, allowing windows at high level on this side of the classrooms, giving good cross ventilation.

Full advantage has been taken of the recommendations in the Board of Education Regulations in the planning and equipping of the school. Four ordinary classrooms and five special subjects rooms have been provided. The assembly hall, which is fan-shaped in plan (for acoustic and seating reasons), has a large-size stage and two dressing-rooms. The rear wall is lined with special sound-absorbing material for acoustic correction. The stage is wired for sound projection, and a cinematograph projection-room is provided. Provision is also made for stage-lighting effects.

A milk bar has been provided within the covered playing space. Incorporated in the domestic subjects room are five separate kitchenettes, each with its own sink, cooker and cupboards. The library walls have walnut panelling, and the interiors of the bookcases are cellulose-painted in colour. The art room has special large north light window in addition to smaller window on the sunny side of the room.

The gymnasium is of standard size, and has separate changing-rooms and shower-baths for boys and girls adjoining. The hot-water supply to the showers is thermostatically controlled for the safety of the children. The floors of the showers themselves are finished with special self-draining asphalt tiles, which are more hygienic and easier to clean than the usual duck boards. The children's cloakrooms are provided with special clothes-hangers instead of pegs, and with heating coils for drying clothes.

CONSTRUCTION: In the construction of the building generally, a light steel framing has been employed with the panel walls of brickwork, treated externally with waterproof cement rendering finished with Derbyshire spar dashing.

Internally the walls and ceilings to the first-floor rooms are lined with special thermal-insulating material to reduce heat losses. Base walls, retaining walls and walls to flower-boxes, etc., where weight is of no importance, are built in random rubble stonework, and are in keeping with the materials used

1. View at Interior of Classroom and Laboratory Wing, showing window to Main Staircase.

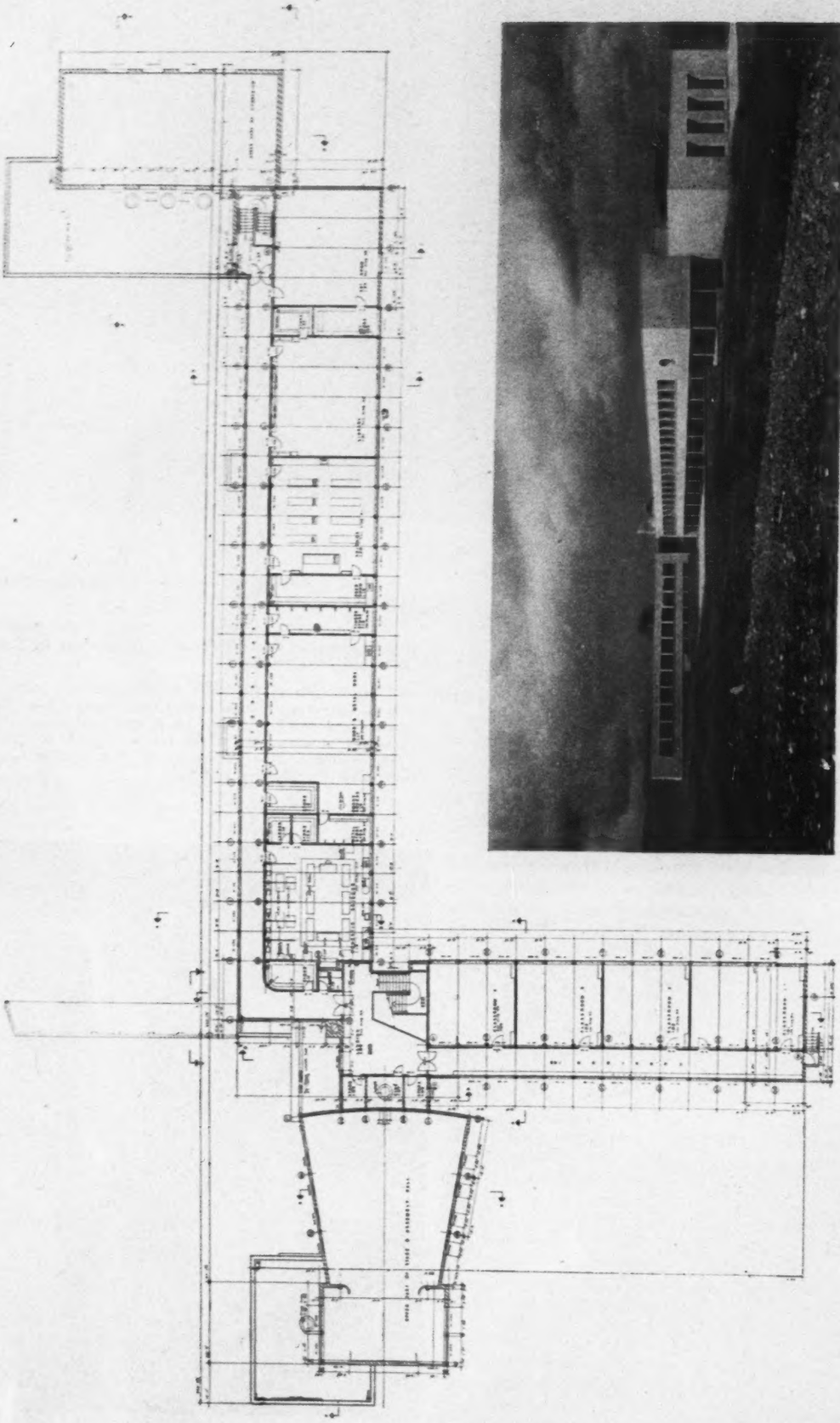
2. View showing Laboratory Wing from Pupils' Playpitch. Pupils' lavatories, cloaks and covered playpitch are on ground floor under laboratories.

3. View showing corridor side of Laboratory Wing and Pupils' Entrances. Flower boxes are in local stone. Gymnasium and changing rooms are in the background. Piers between windows are tiled—ivory-coloured on ground floor, turquoise-blue at first-floor. The piers at pupils' entrances are similarly treated.

3

ECCLESFIELD TOWN SENIOR SCHOOL. SIR JOHN BURNET, TAIT & LORNE, ARCHITECTS.

VIEW OF SCHOOL FROM SOUTH. THE GYMNASIUM IS AT EXTREME RIGHT.



FIRST-FLOOR PLAN.

GROUND-FLOOR PLAN.

ECCLESFIELD TOWN SENIOR SCHOOL. SIR JOHN BURNET, TAIT & LORNE, ARCHITECTS.

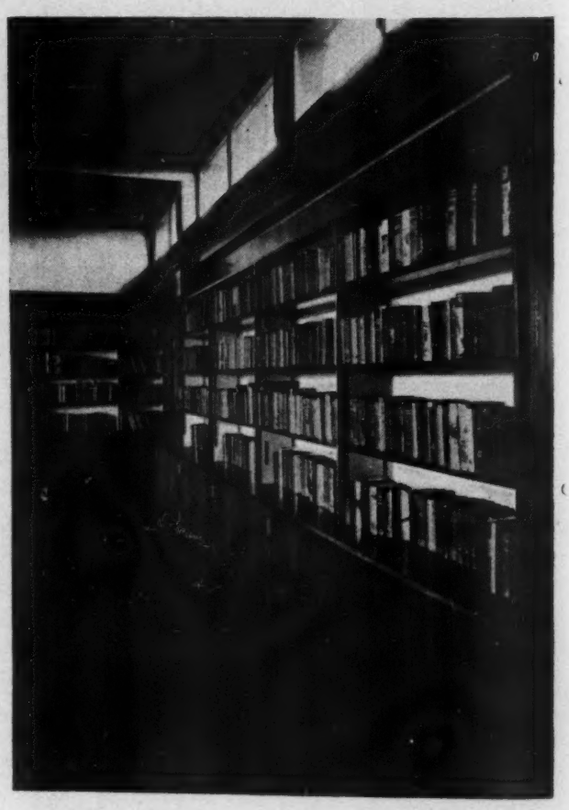
4

4. Main Entrance Hall, showing staircase and covered-way under Laboratory Wing. The staircase is in reinforced concrete with oiled teak treads and risers. Handrails are teak on tubular metal standards. There is a buff quarry tile floor. Walls are painted white and doors Indian red.

5

5. A typical Classroom. Colours are: End wall, pale blue; other walls and ceiling, white; dado in turquoise blue.

6. The Library. Panelling is in Australian walnut ply. Book-cases in same timber, the interiors being cellulosed yellow. Oak strip flooring.



6

locally. Owing to the employment of the steel-frame construction all internal walls and partitions are independent of the main structure, allowing them to be removed should alterations ever be necessary.

SERVICES: The buildings are centrally-heated by a low-pressure accelerated hot-water system, with hot-water supply to lavatory basins and sinks. The gymnasium is heated from the ceiling in order to free the wall and floor space for the apparatus.

The character of the building is the direct expression of the plan, together with the desire to provide airy, sunlit rooms and to avoid all unnecessary embellishments. Colour has been made use of to give a cheerful atmosphere, both within and without the building.

The architects were Sir John Burnet, Tait & Lorne, Mr. Frederick MacManus, A.R.I.B.A., being Assistant in Charge, and the quantity surveyor Mr. Oswald E. Parratt. The builder was Mr. A. F. White.

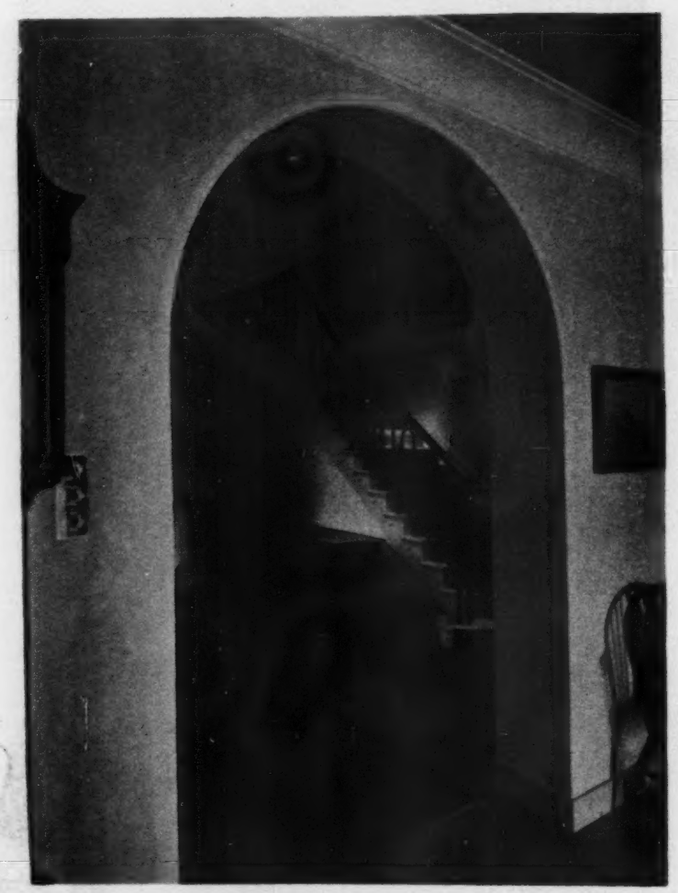
ECCLESFIELD TOWN SENIOR SCHOOL. SIR JOHN BURNET, TAIT & LORNE, ARCHITECTS.

VIEW FROM SOUTH-WEST. *Below* : THE GARDEN ENTRANCE.

HOUSE NEAR BURY ST. EDMUNDS

MR. BASIL OLIVER, F.S.A., F.R.I.B.A., ARCHITECT.

THE DRAWING ROOM. *Below*: VIEW FROM CORRIDOR INTO STAIRCASE HALL.



THIS house takes the place of another on the same site, which was—with the exception of small and unimportant parts of the ground floor of the servants' wing—destroyed by fire.

It has been rebuilt to a different plan to the designs of Mr. Basil Oliver, F.S.A., F.R.I.B.A. The spacious brick-vaulted cellars of the old house were adapted to the new plan, but the new superstructure bears no resemblance to the former building.

The most fundamental change was the transference of the main entrance from the south (garden) front to the west end

(*Continued on page* 55.)

HOUSE NEAR BURY ST. EDMUNDS, SUFFOLK.

MR. BASIL OLIVER, F.S.A., F.R.I.B.A., ARCHITECT.

of the new main block facing the drive. It was thus possible to do away with the former entrance forecourt to the south of the earlier house, which was not particularly interesting, was of no great age, and appeared to have been built about the middle of the nineteenth century, and at any rate at a later date than the kitchen wing.

The change round made it possible to dig up the superseded forecourt and to turf its site and to lay some paving to the full length of the house (*i.e.*, 65 ft. by 12 ft.). This is of cast stone—supplied by the Cambridge Artificial Stone Co., Ltd.—almost level with the grass. Privacy for this sunny sitting-out place is secured by a new screen hedge planted in line with the west end of the building.

This rearrangement made a great improvement, and the new plan was developed axially from it. The part destroyed was built of white Suffolk bricks, presumably from Woolpit, in the near neighbourhood. What remained of the servants' quarters, however, was built of flint with red brick dressings. It was decided to face the new work with red multi-coloured stocks, of a pleasantly subdued tone, made by Messrs. W. H. Collier & Co., Ltd., of Marks Tey, and these were built in Dutch or English cross-bond with light flush mortar joints, by Messrs. H. Boon & Co., builders and contractors, of Fordham, Ely, Cambs.

Messrs. Thompson Brothers, of Market Thoroughfare, Bury St. Edmunds, installed the heating and hot-water systems, and carried out all the plumbing.

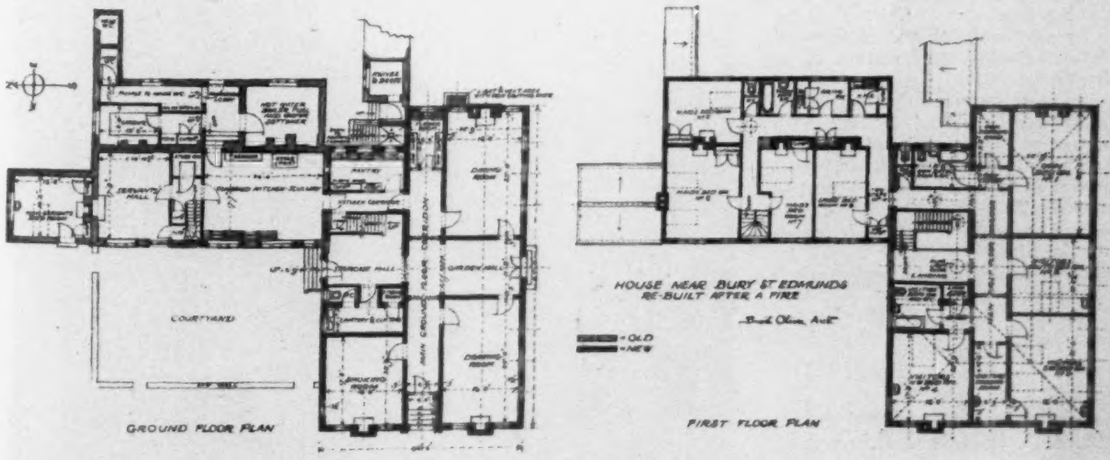
Mr. William J. Bird, of 39, Thornbury-road, Brixton Hill, S.W.2, was the electrical engineer; and Messrs. F. Clubb & Son, Ltd., of Park Works, Sudbury, Suffolk, executed the wrought-iron balustrade to staircase and landing, and the lead glazing to west entrance doorway and (with "Norman slab" glass) to flower room screen panels and fanlight.

THE SERVANTS' WING.

Messrs. Sims, of Bury St. Edmunds, were the sub-contractors for the internal plastering and external coved cornice.

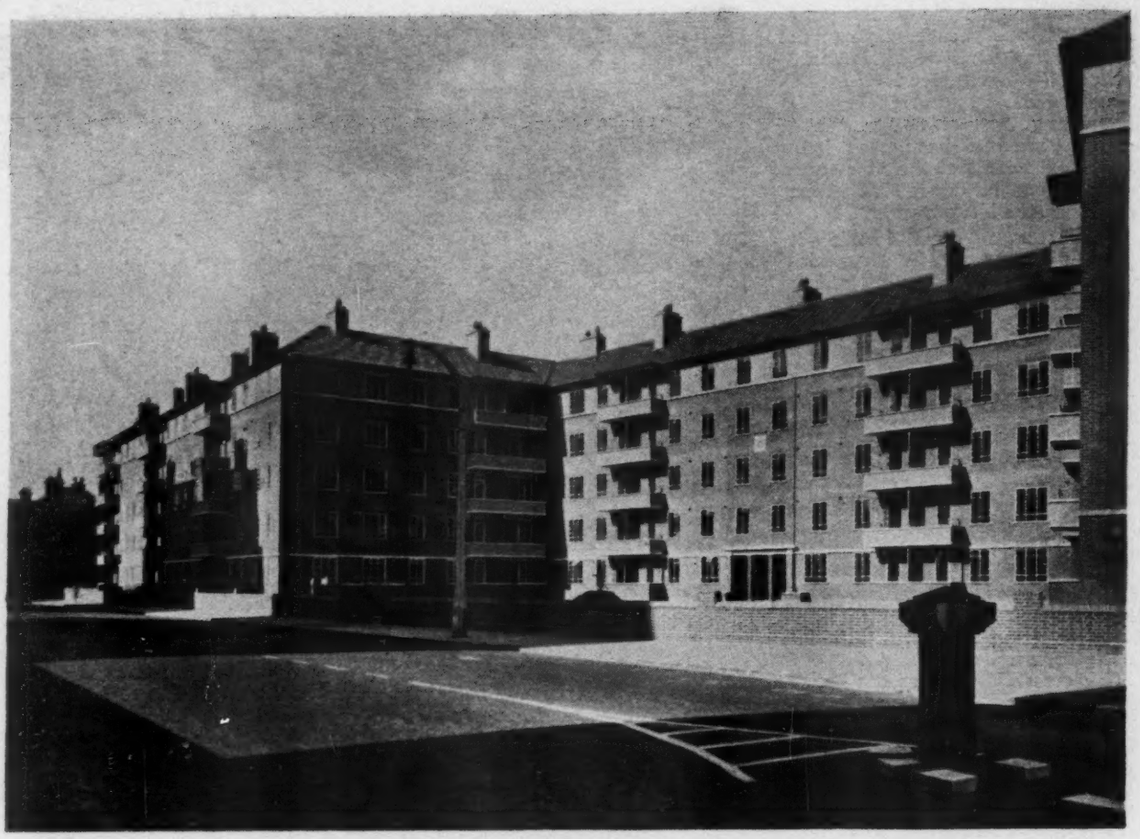
The joinery was made by Messrs. Herbert E. Taylor & Co., Ltd., of Cringleford, Norwich.

The sanitary fittings were supplied by Messrs. John Bolding & Sons, Ltd.; and the electric light fittings came from various sources, but chiefly from Messrs. Troughton & Young, Ltd., Messrs. Harvey Nicholls, Ltd., and from Messrs. Waring & Gillow, Ltd. Messrs. G. Jackson & Sons, Ltd., made the mantels, with marble slips, to dining-room and drawing-room (to the architect's designs), and supplied one old hob-grate for smoking-room. Various other grates and mantels were supplied by Messrs. G. Matthews, Ltd.; the Welbeck Street Fireplace Galleries, Ltd.; Messrs. Bratt, Colbran, Ltd.; and the Carron Company. Messrs. Comyn Ching & Co. (London), Ltd., supplied the ironmongery; and Messrs. R. L. Pickard & Co. the cast-iron rain-water heads. In the kitchen is an "Aga" cooker. Messrs. Hope's metal windows were used for the servants' wing, which has a flat roof covered with asphalt. Grey Delabole slates, diminishing upwards, were used for the roof of the main block, for which Messrs. Stirling & Johnson were the roofing contractors.



HOUSE NEAR BURY ST. EDMUNDS.

MR. BASIL OLIVER, F.S.A., F.R.I.B.A., ARCHITECT.



MAIN ELEVATION FRONTING NORTH END ROAD.

"BURNE-JONES HOUSE," NORTH END ROAD, FULHAM, S.W.

SITE: This block of 95 flats for working-class families has recently been completed for Fulham Borough Council on a site in the North End-road adjoining the fine old house in which Burne-Jones lived and worked for 30 years. This gives the name to the flats.

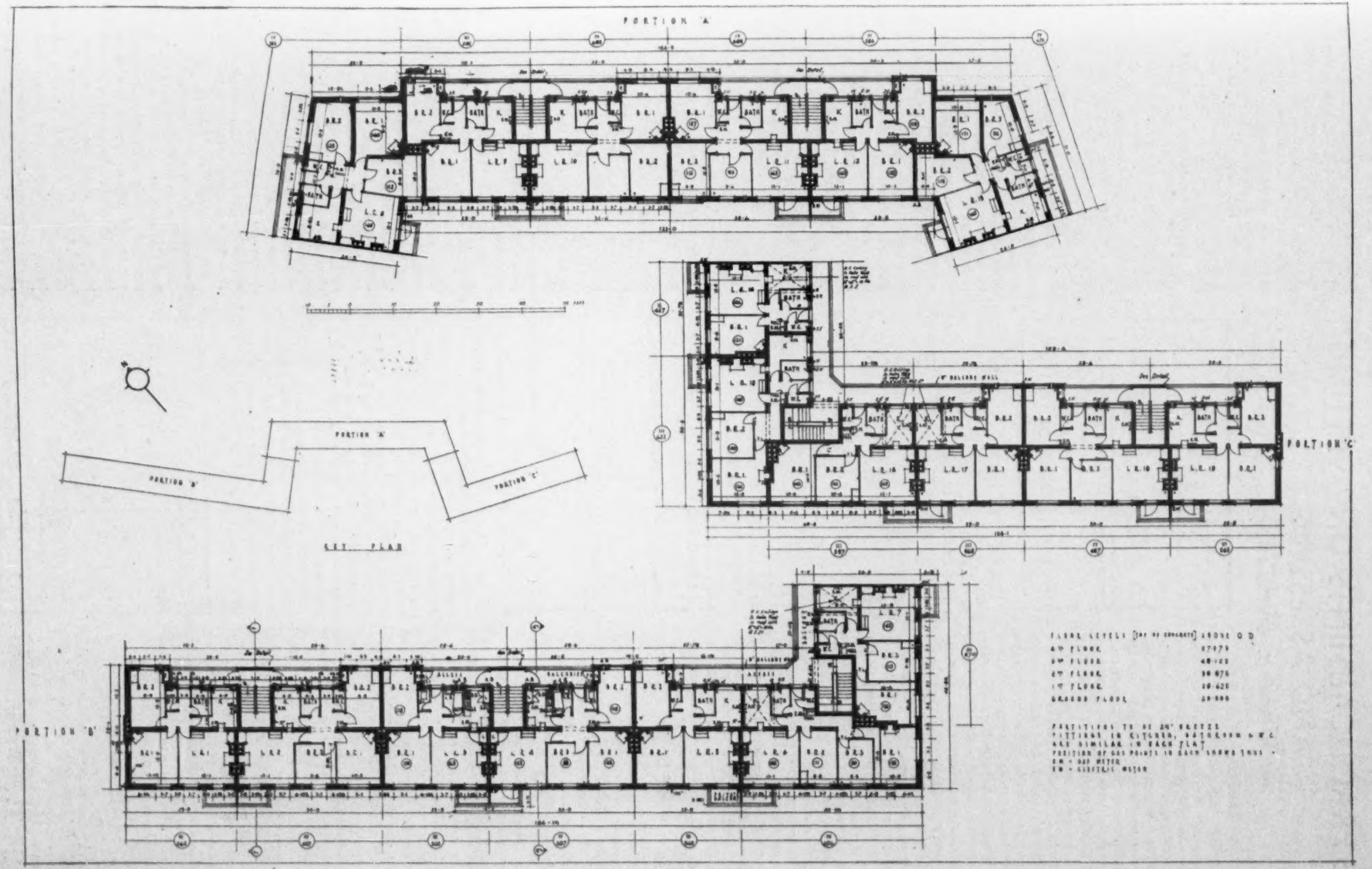
PLANS: Each flat has separate approach by balconies from the staircases, and contains living-room, kitchen, bathroom, separate w.c., and a number of bedrooms varying from one to four. Cooking is by electricity or gas at tenants' choice. Rents vary from 12s. 4d. to 19s. 7d. per week.

CONSTRUCTION: Is steel-framed faced with dark-red facings, with plinth of Lawrence's purple and dark reds. Rear elevations and front balconies are in selected second stocks. The balconies are treated with low brick fronts and guards of "Weldmesh" fabric. Floors are of reinforced concrete, and windows are Crittall's metal casements in wood frames. External cills are of quarry tiles. Roofs are covered with "Double Roman" tiles.

The contract price was £54,859, and the contract was carried out by the Taylor Woodrow Construction, Ltd., of Southall, who, in the words of the Borough Surveyor, "are to be congratulated on completing the work in the manner they have." Messrs. C. E. Ball and Partners were the quantity surveyors; the clerk of works was Mr. C. L. Cullen. Sub-contractors are on page 73.

MR. A. F. HOLDEN, M.Inst.C.E., BOROUGH ENGINEER AND SURVEYOR, assisted by MR. E. A. H. MacDONALD, A.R.I.B.A., ASSISTANT ARCHITECT.

ELEVATION IN REAR COURTYARD, SHOWING SEPARATE APPROACH BALCONIES.



TYPICAL FLOOR PLAN AND SITE PLAN.

"BURNE-JONES HOUSE," FULHAM. MR. A. F. HOLDEN, M.INST.C.E., BOROUGH ENGINEER & SURVEYOR, assisted by MR. E. A. H. MacDONALD, A.R.I.B.A.

WAR DAMAGE TO BUILDINGS

SOME PRACTICAL HINTS ON "VETTING" AND ASSESSING

By FRANK T. WINTER, F.R.I.B.A.

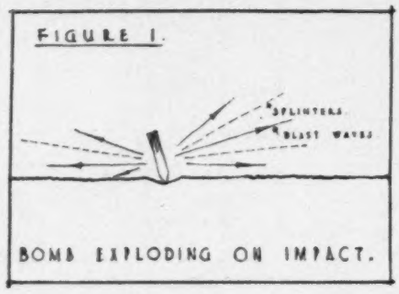
THEORY.

In studying the characteristics of physical damage to buildings resulting from enemy action, it is perhaps helpful to know something of the theoretical principles involved when a bomb explodes. Such theories are of considerable mathematical complexity and are capable of being tabulated with a fair degree of accuracy. On the other hand, effects may in practice become complicated by unknown factors or local conditions, and the behaviour of blast may produce unexpectedly erratic results. We may have seen an ordinary street lamp standing serenely dignified and erect on the very edge of a crater, apparently unscathed, and we know how human life can be saved by some freakish and seemingly inexplicable phenomenon.

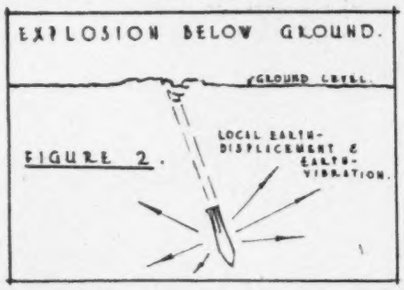
The types of high explosive bomb with which for our present purpose we are most concerned can roughly be classified as (1) light case, (2) medium case, and (3) heavy case bombs. The first are of any size (including parachute bombs or "mines"), contain up to about 60 per cent. or more of charge by weight, and are designed to burst on impact and to give the maximum shattering effect. The second, normally weighing anything from about 50 lb. up to 1,000 lb., with a charge of about one-third, also explode on impact or after a slight delay sufficient to allow the target to be penetrated. The third, normally weighing from about 250 lb. to about 2,000 lb., contain a relatively smaller charge but have greater penetrative and disruptive power.

Let us examine briefly the processes involved in the explosion of a typical medium case (general purpose) bomb on the surface of, but not penetrating, the ground. Detonation of the charge takes place in a small fractional part of a second, causing the casing to swell and burst, thereby releasing hot gases at great velocity and exerting intense pressure on the air with which they are in contact. This violent compression is in the nature of a sharp blow, and, while its immediate physical reaction upon the air is localised, it sets up a shock-wave consisting mainly of an almost instantaneous positive phase (pressure), followed by a negative phase (suction) of less intensity but of longer duration. The shock-wave thus formed is air-borne much in the same way as a sound wave is transmitted—*i.e.*, without actual movement of the air itself. As this wave impinges upon a structure or upon a unit of a structure, stresses are set up which, according to varying conditions, may shatter it and cause its collapse towards or away from the source of blast. The natural modes of vibration of the structure or of its component parts here constitute an important factor.

As the bomb explodes, fragmentation of the casing takes place, the splinters being forced with intense but quickly diminishing velocity in the same direction as the shock-waves. The more vertical the fall, the more horizontal will be the course of the fragments, but angles up to 60 deg. may be expected from direct-impact bombs. (See Fig. 1.)

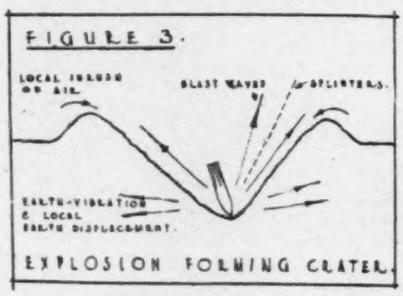


It more often happens, however, that some degree of penetration takes place, varying according to the nature of the target or earth, or the nature of the fuse. If a bomb strikes or penetrates a building from the top or at an angle, partial or complete destruction will obviously be caused by the immediate effects of impact and blast, but effects more subtle, and hence more difficult to deal with, may be caused by bombs penetrating the ground away from the building. If detonation takes place after deep penetration, the force of the explosion may be confined to the earth, causing an underground chamber of compression without any great disturbance to the surface. (See Fig. 2.)



In such a case localised earth-displacement occurs and earth-vibration is set up, which may disrupt or affect any underground structure such as a basement or foundations coming within its sphere of action. The radius of rupture depends, among other things, upon the nature of the subsoil, being smallest in dense rock (comparable with good concrete) and greatest in sand, stiff clay coming about midway in the range.

Between these two extremes is the bomb which penetrates the earth, the explosive force taking the line of least resistance (upwards) and forming a conical crater. (See Fig. 3.) Here the effects are more



numerous and complex, and may consist of (*a*) the setting up of shock-waves at an angle to the horizontal, and propagated through the medium of the air, (*b*) fragmentation, (*c*) localised earth displacement, (*d*) earth vibration, and (*e*) localised suction caused by an inrush of air following the expansion of the hot gases. These and other factors may all play their part in damaging a building.

A knowledge of the processes outlined above can serve only as a guide to what may happen in theory under average conditions. Complications may well arise in practice, as, for example, the reflection of shock-waves from other buildings or obstacles in a street or built-up area.

DAMAGE TO BUILDINGS.

For the purpose of considering the application of these theories, let us imagine that our client has instructed us to prepare on his behalf claims for compensation in respect of four buildings each of a different type and damaged in varying degrees.

Our first duty, naturally, is to make a thorough inspection in order to investigate the extent of the damage, to determine and specify the method of repair, and to estimate the cost of reinstatement.

We find that the first building, a domestic one constructed with solid load-bearing walls, has received a direct hit, and is clearly damaged beyond repair. It will be noticed that the explosion, having no lateral lines of least resistance other than the relatively small window openings, has of necessity forced the walls outwards, causing the floors to collapse. This is a case for demolition and for the preparation of a straightforward claim, both of which points are touched upon later in this article. It may be that questions relating to party walls may arise, or that temporary shoring or protection may be necessary, and these will have to be settled according to the requirements of the case. The surveyor to the local authority will, of course, give a ruling where the stability of a structure is in question.

The second building has received damage from the effects of a high explosive bomb also, and has been rendered uninhabitable. Is it capable of being repaired? This is a question which we ourselves shall be called upon to answer, but if there is any doubt in our minds we shall be wise to seek the advice of the district valuer as regards compensation and of the local authority as regards structural soundness before taking further steps. The method of assessment in cases of total loss, as mentioned later, will not escape our attention in this connection. Assuming here that reinstatement is practicable, let us consider a few of the defects that we might commonly expect to find.

The *windows* will first be noticed, and it is possible that these may give some clue to the nature of the force acting at the plane of the wall in which they are situated. It is found that panes of glass are more often drawn outwards than forced inwards, the latter direction being more usual when the source of the shock-waves is near. Casements are frequently drawn off their hinges, glazing bars shattered by splinters, and frames dislocated. It appears that metal window frames are less likely to be damaged than wood. Panels of lead-light glazing tend to

buckle and twist. Fixed or closed windows are found to be the more readily acted upon by shock-waves by reason of their rigidity. Much information is now available on the blast-resisting properties of glass, and the reader is referred to the published results of tests made by the Ministry of Home Security and by private manufacturers.

It is commonly found that there is a tendency for *external doors* to be forced inwards, taking the direction of least resistance, and tearing the frame at lock level.

Structural cracks in the *main walls* will need close attention. These may be related to the bulging of wall panels or to the tendency to such bulging, and plumbings may have to be taken. A clue to this kind of damage is often afforded by the examination of skirtings or of the junctions between main walls and cross partitions. Observations tend to show that 11-in. cavity walls are more susceptible to the suction effects of blast than are solid walls, although in many cases dislocation occurs mainly in the outer skin. Similarly, an outer facing will sometimes come away from the more solid backing of a wall if the bond is poor. An ordinary brick gable of a house has been seen to lean as much as 6-in. or more towards a bomb crater. In this connection it is interesting to note that the tenacity of good brickwork is greater than commonly supposed, and slight damage does not necessarily indicate material deterioration. A wall parallel to the direction of the blast-waves will normally be little affected by them, unless the element of reflection is considerable.

Signs of cracking near the base of a wall may indicate damage to *foundations* caused by earth-displacement or earth-vibration effects, which the presence of a basement will render more easy to detect. (See Fig. 4.) Normally no serious damage may be expected underground unless the bomb has penetrated fairly close to the structure, this, at any rate, being the general indication in the light of experience.

Damage to walls may also be caused by *fragmentation*, this being greater in proportion to the horizontality of the blast-waves. Damage in this case occurs by pitting, and the method of repair often constitutes a difficult problem, varying according to the type of facing material. The penetration of bomb splinters into a hard wall surface rarely appears, in practice, to attain to any serious dimension, neither is the phenomenon of "scabbing" often observed on the reverse side of walls or partitions. Splinters, however, may quite well pass through windows and light partitions horizontally to damage a wall beyond, or upwards to cause damage to ceilings.

Chimney-stacks are frequently found to be damaged by the shattering effect of blast-waves. They should be examined inside as well as outside the roof, although it is only the part directly exposed that is usually found to be fractured. Cases are known where an explosion taking place below ground (*i.e.*, without forming a crater) has caused its maximum damage at the upper part of a chimney-stack, apparently through vibration at the base. The loosening of pargetting in chimney-stacks may prove a troublesome defect to deal with.

At right-angles to the direction of the blast-waves, *internal partitions* are often found to bulge or lean in either direction, or, if parallel to it, to crack or pull away from the outer walls to which they are bonded. The loosening of *plaster* from partitions and ceilings is an obvious reaction to any system of shock or vibration in a building, and deterioration may be increased by subsequent water damage.

REACTION OF ROOFS.

The reaction of *timber-framed roofs* to blast is interesting. We are familiar with the smudgy effect produced by the wholesale slipping of tiles from their battens and these can usually be refixed without difficulty provided that supplies of tiles are available to replace those that have been broken. High-pitched roofs are rather more susceptible to damage than those of lower pitch on account of the greater resistance which they offer. Care should be taken to examine any monolithic flat there may be between the ridges of a tiled roof, as, by reason of its comparative rigidity, cracks may develop under the action of vibration. Generally speaking, timber framing of the type found in any average roof is particularly resistant to blast, and where fracturing or dislocation occur these can usually be traced to stresses originating in the movement of walls and wall-plates. (See Fig. 5.)

The same observations seem to apply to timber framing generally, and we may expect to find that at least the structural part of *timber buildings* will react well under all but severe conditions. Wood floor joists, too, will seldom be dislocated unless their bearings are destroyed.

Much damage can be caused to roofs by the fall of earth, débris, or road material, and, to a less extent, by splinters. Cast-iron *gutters and pipes* should receive special notice, as fractures are to be expected owing to the brittle nature of the material. Joints in these pipes are very commonly found to need remaking.

Installations of *internal plumbing* and heating and hot water pipes should be examined, and in cases of severe shock they should be tested. One minor point to watch is that horizontal lead pipes, such as those found in a roof space, are under some conditions apt to develop sagging between the supports. The cracked trap of a w.c. pan is a defect that should always be looked for, also the cracking of an earthenware lavatory basin due to falling plaster.

It is advisable wherever possible to make a test of *electrical installations*, and this should, of course, be done after the building has been made weathertight and any likely effects of damage by water taken into account.

As with foundations, it is found that *drains* seldom suffer material damage except from delayed-action bombs. The state of the manholes will usually give some indication as to whether or not the

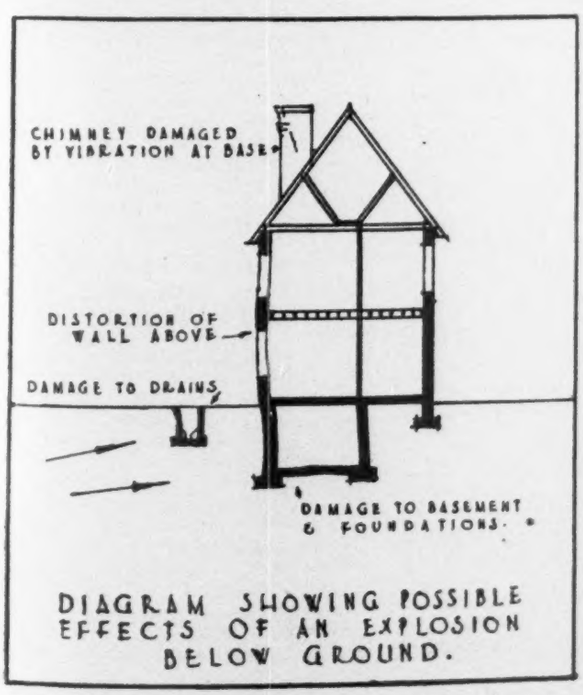


DIAGRAM SHOWING POSSIBLE EFFECTS OF AN EXPLOSION BELOW GROUND.

FIG. 4.

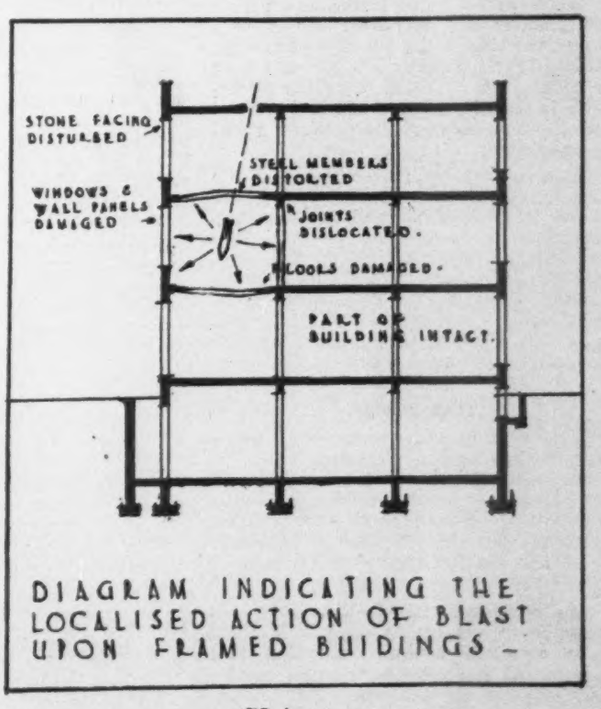


DIAGRAM INDICATING THE LOCALISED ACTION OF BLAST UPON FRAMED BUIDINGS.

FIG. 6.

pipes have been affected, but in some cases a test of the system may be considered advisable. Some difficulty may arise here, as a test will not afford conclusive evidence that defects were not there previously. Cast-iron pipes may be expected to offer less resistance to shock than stoneware, on account of their longer lengths and brittle nature.

The *reinstatement of ground* after cratering is worthy of special care, and the earth ought to be firmly consolidated in order to prevent later subsidence of the foundations, either by sliding or by shrinkage of subsoil due to the gravitation of water into the crater.

An important question, about which a good deal of uncertainty has existed in the minds of architects and surveyors, is that of redecoration and repainting. This point is touched upon under the heading "Compensation."

FRAMED BUILDINGS.

The third building with which we have to deal is one of the modern steel-frame type. Here we shall be wise at once to take into consultation a structural engineer and the various specialist firms whose work has been affected. In this article such a complex subject can be dealt with only by a few general observations.

A building constructed of steel or reinforced concrete framing is less liable to collapse than is a building of the type more particularly considered above. To take the case of a bomb bursting inside a building of this kind, the normal tendency will be for the blast to find its lines of least resistance, and these will naturally be afforded by the ample window openings and relatively thin panel walls and fillings. This process tends to leave the main structural framework intact, and it follows also that the framework's immunity from damage is largely proportionate to the lightness of the fillings.

The same principles apply to a bomb bursting outside a building, compressional and suctional effects being much the same as before so far as wall panels and windows are concerned. If the bomb strikes the side or the top of the building, damage to the framework is almost bound to occur, but in either case the probability is that the damage will be local and that the remainder of the framework will be unaffected. (See Fig. 6.)

Distortion of steel members and the shearing of rivets and plates must be looked for closely, as well as the consequent effects upon structural floor and wall panels, stanchion and beam casings, adhesion of concrete to its reinforcement, and the condition of stone or other facing materials. Presumably scientific data upon this subject will in due course be collected and become available for study.

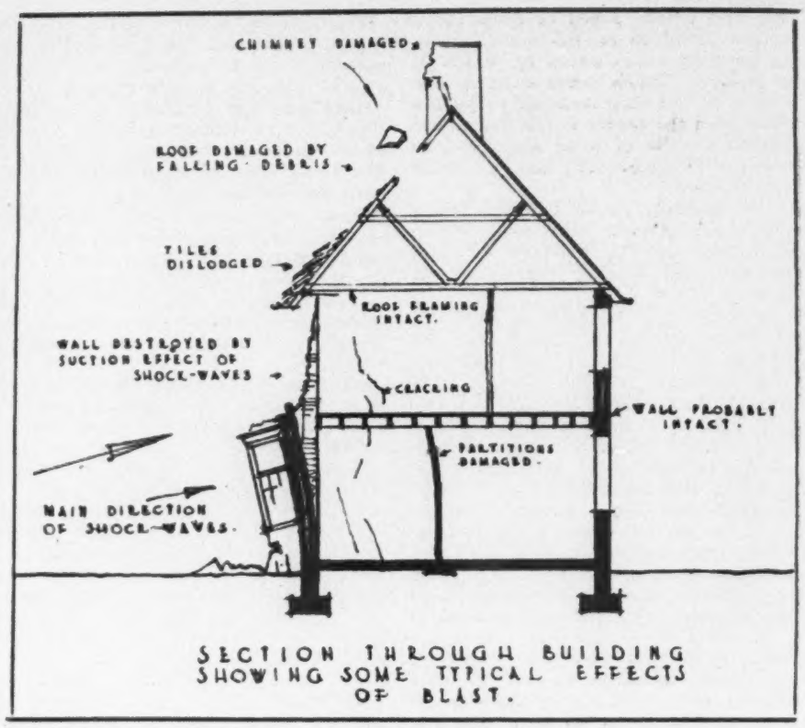
FIRE BOMBS.

The fourth building to be examined is one that has been damaged by fire. The action of the 2-lb. incendiary bomb is well known, and only one or two incidental points need be mentioned here, it being assumed that the methods of reinstatement will be the same as those adopted in the case of any ordinary fire.

One interesting fact is that an incendiary bomb appears to have little effect upon standard asphalt (provided that mechanical penetration does not occur), and will merely carbonise the surface. Copper roofing has more resistance to heat than might be supposed, on account of its high thermal conductivity.

In the case of a building the roof of which has been damaged by fire, some ingenuity may be required, if timber is not readily available, to devise a safe and satisfactory means of carrying out emergency repairs for the proper protection of the lower floors or of an adjoining building.

Crude oil stains from oil bombs are difficult to get rid of, and no reliable method of restoration appears to have been evolved up to the present, other than for stains of small area. No doubt further research will result in a satisfactory treatment being found in due course.



SECTION THROUGH BUILDING SHOWING SOME TYPICAL EFFECTS OF BLAST.

FIG. 5.

FIRST-AID REPAIRS.

Where a house has been damaged, but can be made weathertight, emergency repairs of a temporary nature should be put in hand as quickly as possible. These may be done by the owner himself or by the local authority. The local authority is under a responsibility to initiate such repairs, and is empowered to follow these up at a later date with further repairs of a more permanent nature, according to the demand for housing accommodation in any particular district. A house need not be restored to its former condition, but merely rendered habitable.

The local authority may use its discretion as to which houses are to be repaired in any given area, and their order of precedence. In this connection the local authority may consider representations made by an owner, and may come to an agreement with him, but the owner has no formal means of appeal against the authority's decisions or proposals.

The cost of emergency repairs carried out under this scheme will be registered as a charge on the property at the end of the war.

The procedure as to first-aid repairs, further amplified, is set out in the Minister of Health's circulars Nos. 1810 and 2114, dated August 18, 1939, and September 12, 1940, respectively, to which, together with the Housing (Emergency Powers) Act, 1939, the reader is referred.

Procedure relating to emergency repairs to "essential buildings" other than housing is dealt with in the Minister of Health's Circular No. 1848, dated September 4, 1939, and the Essential Buildings and Plant (Repair of War Damage) Act, 1939. This provides that repairs must be carried out by owners or occupiers themselves, who are empowered to obtain requisite materials through the local authority and, if necessary, financial assistance in the form of loans.

On the eve of the intensive air raids on London, and before these provisions had commenced fully to operate, a writer in this journal likened the local authority to the house-owner's Fairy Godmother. If, in the cold light of day, we find his flight of imagination a trifle whimsical, we do not alter our view that the present scheme is a workable one, given a reasonable amount of co-operation and good will on both sides.

DEMOLITION AND SALVAGE.

Powers have been given to local authorities under Regulation 50 of the Statutory Rules and Orders, 1940, No. 1750, to enable them to remove and dispose of débris and to salvage materials from bombed sites. It is worth mentioning that in the London region provision has been made for an owner to retain and use some of the materials for his own purposes in rebuilding operations or in repairs, and presumably the same procedure will be adopted elsewhere.

A local authority does not always notify the owner of a damaged building of its intention to demolish, but a mutual understanding before the intention is put into operation is manifestly desirable. It is suggested, accordingly, that the owner or his agent should confer with the local authority's surveyor as soon as possible after the damage has occurred.

COMPENSATION CLAIMS.

The Government's new measure for compulsory insurance of property has not, at the time of writing, become law. For this reason the subject of compensation, with which the public is already familiar in principle, will be confined here to a few practical observations intended to be helpful to those whose duty it may be to prepare compensation claims under the present scheme.

The first step, after obtaining a copy of Form V.O.W.1 from the local authority, is to make a survey of the damage and to prepare an estimate of the cost of reinstatement. For some types of buildings, such as a church, which have no definite market value, this is all that is needed, but in all cases where the building has, or had, a market value, a comparative estimate is required to show the diminution in that value as the result of damage, the property being regarded as freehold, in possession, and unencumbered. The claim has then to be made according to whichever is the *less* of the two estimates. For buildings totally demolished or damaged beyond repair, diminution in market value becomes, as a general rule, the accepted method of assessment.

The assessment of war damage for the purposes of compensation is governed by this and other factors, which may be stated briefly as follows:—

(1) Whichever of the two systems of assessment is adopted, it will be found that diminution in market value fixes the limit for compensation.

(2) Only physical damage to property may be assessed, and consequential loss, such as loss of rent, may not be taken into account.

(3) The prices of materials and labour ruling in March, 1939, are to be taken as the basis of assessment, both as regards cost of reinstatement and market value.*

(4) For property not in being in March, 1939, the limit will usually be fixed by the original cost of the property.

(5) For property purchased after the outbreak of war in an undamaged condition, the limit will not exceed the price paid, even if that price should be less than the market value as calculated on March, 1939, costs.

Fixed machinery and plant which is rateable is valued with the fee simple of property to which it belongs. A group of properties in the same ownership may be combined to form the subject of a single claim or may be separated, as desired by the claimant.

Where there is more than one interested party, such as an owner and a mortgagee, the procedure is simplified if one claim only is made in respect of the damaged property. It follows that each party should agree with the other the extent of the damage and the amount claimed as compensation, the manner in which the amount is finally apportioned being left in abeyance.

The term "reasonable reinstatement" is one which is likely to lead to some difficulty and confusion. It does not necessarily mean reinstatement of a building to its former condition, but is rather defined as the extent of repair which a "prudent man might be expected to undertake, regard being had to all the circumstances of the particular case."

If a brick wall is slightly out of the upright, it may be that its structural stability is not impaired, and this will be a case for agreement with the district valuer. Similarly, it is quite possible for a slight deformity to occur in the steelwork of a framed building which will have no detrimental effect on its structural effectiveness.

A difficulty that may frequently arise is that of determining the extent of damage to certain parts of a building—*e.g.*, foundations or drains, where superficial examination does not afford conclusive evidence of deterioration. It is suggested in such cases that a covering clause should be inserted in the schedule reserving the claimant's right to make a supplementary claim for the reinstatement of damage latent or undisclosed at the time of the original survey. It is likely that a supplenmentary claim of this kind would be regarded as admissible.

It is obviously not permissible to include the making good of old cracks such as settlement cracks in brickwork or plaster unless there is definite evidence to prove that these have been aggravated as the sole result of war damage. Here, since defects were present before the date of damage, it is probable that a district valuer would suggest a compromise, allowing as compensation a part only of the cost of repair.

When plaster cracks in a wall or ceiling necessitate redecoration, the district valuer, before admitting the claim, will take into account the condition of the decorations at the time. If a single window in a room or on an outer wall has to be painted by reason of some repair or renewal, it does not necessarily follow that a claim for repainting the rest of the work to match it will be admitted.

The cost of first-aid repairs should always be included even if it is only possible to state a provisional sum. If repairs of a permanent nature are put in hand, the cost of these should be stated at current prices, as with first-aid repairs, and a note to that effect should be clearly stated when making the claim. Any necessary adjustment would be made by the District Valuer afterwards.

PROFESSIONAL FEES.

Fees incurred by the claimant in connection with the survey and preparation of the claim are not admissible, but, if employed, architect's and quantity surveyor's fees (and reasonable out-of-pocket expenses) for reinstatement work may be included. It is assumed also that fees properly incurred in connection with such matters as party wall awards are admissible.

An architect or surveyor should be in a position to substantiate his claim and will use his own discretion as to the method of preparing his estimate. In the average case, however, it is neither necessary nor desired that a lengthy statement should accompany the submission of Form V.O.W.1. It should be remembered that the district valuer will normally make his own independent valuation, through his panel of expert advisers, and may even do this before the receipt of the claim.

In case of difficulty the district valuer will usually be willing to advise architects or surveyors on the site before a claim is prepared, but he is a busy man and should not be troubled in this way except when his advice is particularly desired.

Whenever possible claims should be submitted within the stipulated period of thirty days, in order that the district valuer may have a fair chance to keep pace with his work and maintain at the same level of advancement all the claims with which he has to deal.

In conclusion, it may be well to emphasise the point that a fictitious or exaggerated claim is likely to meet with little sympathy from the district valuer and may prejudice the claimant's chances of success. On the other hand, fairness in the preparation of an estimate is not likely to be overlooked but is likely to be met with the fairness it deserves.

* These will be found on pages 64 to 66.—ED.

THE WAR DAMAGE BILL

By W. T. CRESWELL, K.C.

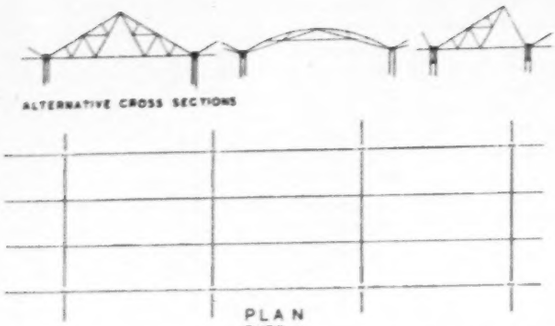
AFTER the recess, the House of Commons is further to debate the War Damage Bill. As in all schemes of insurance, the kind of loss to be insured against—that is, loss to some by damage from enemy action—is to be made good from the total contributions of the community. The sufferers are assisted by those who are more fortunate and who do not suffer.

The Bill has been received with general acclamation as being a security measure of the first order to every individual property owner. It is recognised, however, that before the Bill becomes law there is a general call for the consideration of some knotty points. One of these is why the insurance of personal chattels, a matter so closely allied, has not been made compulsory also. The only answer so far given in Parliament is that the latter insurance would be, administratively, almost unworkable, even if it were possible (and it is alleged it is not) to obtain reliable assessment of chattels even at the cost of an enormous amount of technical work. Professional valuers argue that they are quite capable of making such valuation on the claims as they arise. Also, since there is to be set up a War Damage Commission of some four or five persons, this Commission would no doubt be able to deal judicially with any irregularities which might creep into the assessment.

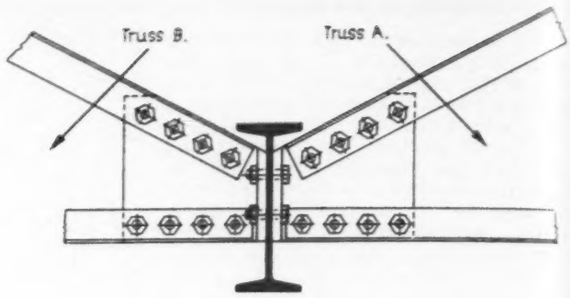
Another moot point is whether the recognition by the Government of any claim would create a negotiable security. The answer so far given to this is that a recognised claim would not be negotiable, although in certain circumstances permission to transfer or assign a claim might be granted at the discretion of and by the War Damage Commission itself.

Great objections have been raised to the decision to base "value payments" on the value of property at March 31, 1939. The method of compensation by "value payment" is only to be employed if to repair the damaged building would not be economical; that is, when the cost of repairing it would be greater than its final value after repair. Sir Kingsley Wood stated, when introducing the Bill in Parliament, that as a general rule the alternative method of a "cost of works" payment would be employed when that cost would not exceed the final value, and he was understood to state further that in this case the cost would be calculated on the prices current at the time of the work being executed, whenever that might be. Also, this cost would be paid at once in respect to any particular building, the immediate replacement of which was a matter of national interest. "Value payments" would be made at the end of the war only.

It has been stated that the compulsory contribution is, in effect, an extension of income tax demanded of property owners. This is hardly correct, because it is obviously an insurance in circumstances where the enemy has chosen destruction of property as an effective part of the war on the civil population.



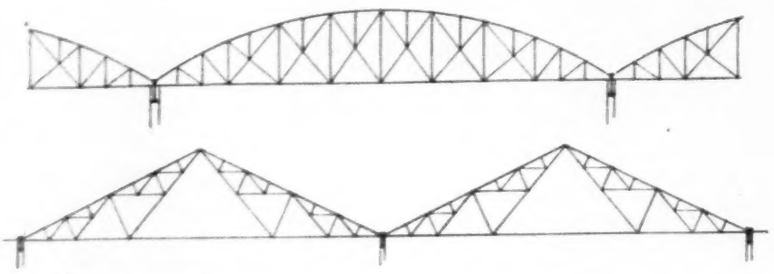
SHORT SPAN ROOF TRUSSES CARRIED ON VALLEY BEAMS
FIG 1

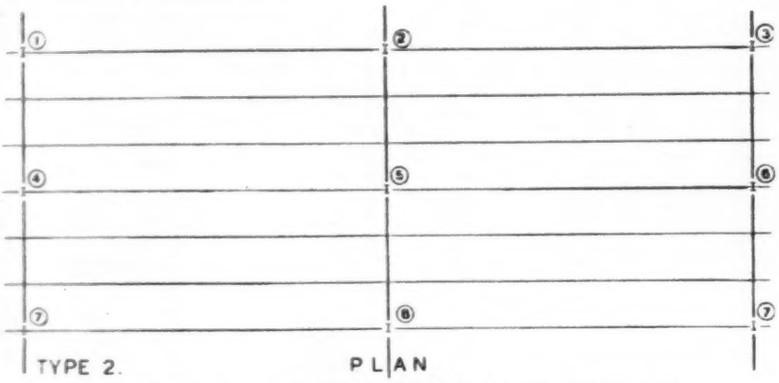


TYPICAL CONNECTION OF TRUSSES TO VALLEY BEAMS
FIG 2

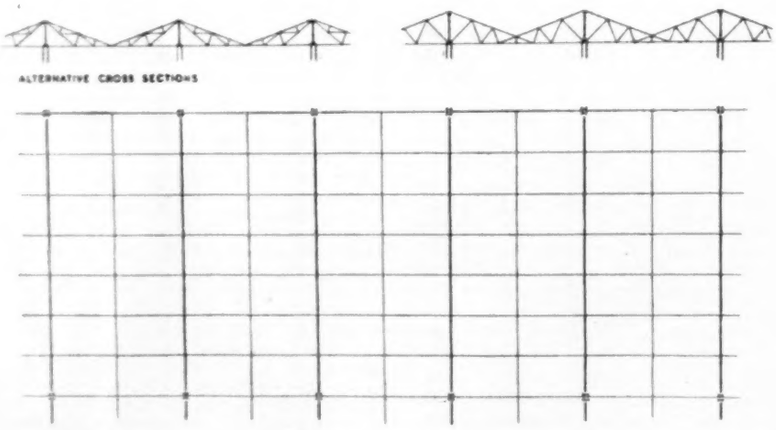
War Damage to Buildings.

STEEL-FRAMED SHED BUILDINGS AND AIR ATTACK





LONG SPAN ROOF TRUSSES CARRIED ON VALLEY BEAMS
FIG 3.



CANTILEVER TRUSSES CARRIED ON APEX LATTICE GIRDERS
FIG 4

STRENGTHENING AGAINST COLLAPSE.

HOME SECURITY BULLETIN NO. C.15.

THE Ministry of Home Security (Research and Experiments Department) have issued Bulletin No. C.15, dealing with "Strengthening steel-framed shed buildings against collapse, due to air attack."

Most fully steel-framed single-storey factory buildings (states the Bulletin) are highly resistant to structural damage by air attack. In an earlier Bulletin* it was mentioned that, where buildings of this type had received direct hits, damage was usually confined to the roofing material, the structural framework escaping undamaged.

Cases have recently occurred, however, in which a chance hit close to a stanchion has uprooted it, bringing down a portion of the roof steelwork. Interference with production has then been much more serious than where the damage was confined to the roof sheeting.

Where structural collapse has been limited to that portion of the roof carried by the damaged stanchion, the amount of steelwork destroyed has been comparatively small. Sometimes the collapse has spread and involved a whole line of trusses, and several hundred tons of structural steel have been irreparably damaged. Such collapses are very serious, involving not only considerable loss of production, but also heavy calls for new steelwork.

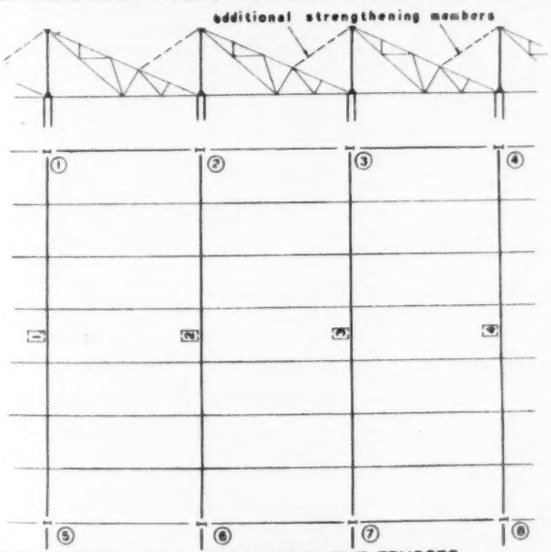
In new factories there will be little danger of this spreading collapse if suitable designs are used, such as those recommended, on the advice of this Department, in Wartime Building Bulletins Nos. 1 and 4. Certain existing factories are, however, singularly liable to spreading collapse, and it is essential that this danger should be eliminated. Fortunately, the necessary measures are comparatively simple and the steelwork required to make existing factories resistant to collapse represents only a minute fraction of that which is otherwise liable to be destroyed.

The recommendations given in this Bulletin for strengthening the various types of roofs apply principally to factories where additional internal strutting is precluded by the necessity for an un-

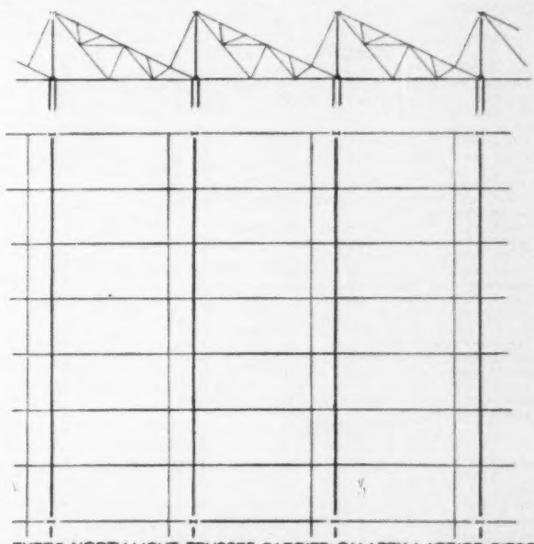
* R. and E. Bulletin, No. C.8.

TABLE OF ROOF TYPES AND PRECAUTIONARY MEASURES.

TYPE NO.	TYPE OF ROOF.	VITAL MEASURES THAT SHOULD BE TAKEN TO PREVENT A VERY SERIOUS SPREADING COLLAPSE.	MEASURES WHICH IT IS DESIRABLE SHOULD BE TAKEN TO MINIMISE THE DANGER OF A LOCAL COLLAPSE.
1.	Short span roof trusses carried on valley beams or valley lattice girders (span of truss not exceeding about 60 ft.). (See Fig. 1.)	The ends of each pair of trusses framing into a valley beam should be independently connected to it.	The strength of the valley beam splices should be increased by site welded cover-plates to enable them to span across two bays if a stanchion is destroyed.
2.	As above, but span of trusses exceeding about 60 ft. (See Fig. 2.)	Wind bracing in the plane of the rafter should be provided at intervals, not exceeding twice the span of the trusses, along the factory.	As above.
3.	Symmetrical cantilever trusses carried on apex lattice girders. (See Fig. 3.)	Adequate anchorages should be provided at the ends of the trusses along the side walls of the building.	There is little danger of a local collapse with this type of roof.
4.	Vertically glazed north light trusses carried on lattice girders in the plane of the glazing. (See Fig. 4.)	Additional external members should be provided spanning between the apex of each truss and the rafter of the adjoining truss.	The measures recommended in Col. 2 eliminate the danger of either a local or a spreading collapse.
5.	North light trusses (60°-30° or similar) carried on apex lattice girders. (See Fig. 5.)	In general, unless the glazing rafter is very light, these are not liable to spreading collapse.	The apex lattice girders should be strengthened to enable them to span across two bays if a stanchion is destroyed.
6.	Hangar type (all spans) consisting of roof frames or bow string trusses spaced at 12-18 ft. centres, each frame being independently supported. (See Fig. 6.)	Wind bracing in the plane of the rafter (or top chord) should be provided at intervals, not exceeding twice the span of the trusses, along the hangar.	If a roof frame is cut or damaged, little can be done to prevent the collapse of that frame and the portion of the roof carried by it.



TYPE 4. VERTICALLY GLAZED NORTH LIGHT TRUSSES.
FIG 5.



TYPE 5. NORTH LIGHT TRUSSES CARRIED ON APEX LATTICE GIRDERS.
FIG 6.

obstructed floor. In cases where such strutting is possible, however, it can usually be so arranged as to secure virtually complete immunity from collapse. Each strut must be rigidly fixed to the roof member which it supports and should be adequately tied down to a substantial foundation.

It must be borne in mind that the condition for which roof strengthening members are being designed is that of a temporary overload. Moreover, the very events which bring the strengthening members into action also relieve the roof of much of its dead load. The explosion of even a light bomb near a stanchion will remove most of the sheeting carried by that stanchion. It is, therefore, recommended that, in the design of all strengthening members the dead load only of the roof steelwork should be allowed for, and a working stress of 12 tons per sq. in. should be used. It may be argued that the sudden cutting of a member by a bomb will result in load being suddenly applied to the adjacent members and that an allowance for impact should therefore be made. All the available evidence of damage indicates, however, that the loads and stresses recommended above are safe and economical.

There follows a description of six types of roof with the strengthening measures suggested. These types are illustrated in these pages, and the measures have been summarised in the table at the head of this page.

FOR ALL BUILDERS AND CONTRACTORS PLANT
YOUNGMAN
TELEPHONE MACAULAY 2233

1939 BASIC PRICES IN COMPENSATION CLAIMS

Under the War Damage Insurance Bill compensation of two kinds is proposed, namely, "cost of works" payments and "value" payments. The first, in general, represent the actual current cost of repair. If, however, the cost of repair exceeds the value of the building when repaired, then a "value" payment will be made, this being equal to the difference between the values of the property immediately before and immediately after the damage on the basis of prices current at March 31, 1939. Representative prices for materials and measured work at that date are here given.

BRICKS, &c.

Delivered to site, City and Central Area, Full Lorry Loads.

	£ s. d.
Best Stocks	4 15 0
Second Hard Stocks	4 8 0

Per 1,000. Delivered at London Goods Stations.

2½ in. Phorpres.	King's Cross Station. per 1,000. s. d.	To sites in W.C. District. per 1,000. s. d.
Pressed bricks	46 3	50 6
Cellular bricks	46 3	50 6
Keyed bricks	48 3	52 6
Cellular Keyed bricks	48 3	52 6
Rustic bricks	*66 3	*70 6
Cellular Rustic bricks	*66 3	*70 6
Single Bullnose	C4 3	68 6
White bricks	*66 3	*70 6
Sandfaced bricks	—	75 6

* Subject to a special discount of 2s. per 1,000 ft. accompanied by order for Pressed.

	£ s. d.
White Midhurst Facing Bricks (delivered London site)	3 12 6
Best Blue Pressed Staffs	8 6 6
Do. Bullnose	8 16 6
Blue Wire Cuts	7 4 0

Best Stourbridge Fire Brick:—

£ s. d.		£ s. d.
2½ in. 7 15 0	3 in.	8 15 0

GLAZED BRICKS—

Best White Ivory and Salt Glazed Stretcher	24 0 0	D'ble Str'tch'rs ..	32 10 0
		D'ble Headers ..	29 10 0
Headers	23 10 0	One side & two ends	33 10 0
Quoins, Bullnose and 4½ in. Flats	30 10 0	Twosides&oneend Splays and Squints	34 10 0
			31 0 0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours. Hard Glaze, £5 10s. extra over white.

SAND.

	s. d.	
Thames Ballast	7 3 per yd.	delivered 2 miles radius Paddington.
Pit Ballast	6 3 „ „	
Pit Sand	7 9 „ „	
Washed Sand	8 3 „ „	
¾in. Shingle	7 3 „ „	
1in. Broken Brick	11 3 „ „	
Pan Breeze	8 3 „ „	

CEMENT.

Best British Portland Cement. Standard Specification delivered London Area. in jute sacks (11 to ton), or paper bags (20 to ton) free (non-returnable):—

	£ s. d.
4 tor loads and upwards site. Per ton	2 2 0
1 ton to 4 tons site	2 5 0
"Ferrocrete" Rapid Hardening Cement:—	
4 ton loads and upwards site	2 8 0
1 ton to 4 tons site	2 11 0

NOTE.—Jute sacks are charged 1s. 6d. each and credited 1s. 6d. nett, if returned in good condition within three months, carriage paid.

"Aquacrete" Water Repellent, "Blue Circle" Cement, 30/- per ton extra on ordinary "Blue Circle" Portland Cement prices.

"Colorcrete" not rapid-hardening, in 1-cwt. paper bags free (non-returnable), according to colour, from £7 to £15 10s. per ton.

"Snowcrete" White Portland Cement in 1-cwt. paper bags free (non-returnable)

1 ton and upwards site	8 15 0		
Super Cement (Waterproof) paper bags free	3 12 0		
Roman Cement £6 15	Keene's Cement, White	6 0 0	
Parian Cement £6 0	„ „ Pink	5 12 6	

Cementone Colours for cement according to tints per cwt. from £2 16s. 0d.

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	3 2 0	Sirapite, Coarse	3 10 0
„ White	3 12 6	„ Finish	3 18 0
Pioneer	3 10 6		
Super Carbo	2 7 6	4-ton loads and over Area, paper bags free.	London
Carbo Seating	2 12 6		
Best Ground Blue Lias Lime	1 17 6	Grey Stone Lime	2 2 0
		Chalk Lime	2 2 0
Granite Chippings	1 12 0	Hair per cwt.	2 7 6

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d., if returned in good condition within three months, carriage paid.

STONE.

PORTLAND STONE—

	s. d.
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 5
Do. do. delivered on road wagons as above stations, per ft. cube	4 6

White basebed, 3d. per ft. cube extra.

NOTE.—1d. per ft. cube extra for every ft over 20 ft. *average* and ½d. beyond 30 ft.

HARD YORK—

	s. d.
Delivered at any Goods Station, London.	
Scrappled random blocks per ft. cube	6 3
6 in. sawn two sides landings to sizes (under 40 ft. super) per ft. super	5 1½
6 in. rubbed two sides, ditto „	6 1½
¼ in. sawn two sides slabs(random sizes) „	3 1½
3 in. ditto ditto „	2 5
2 in. self-faced random flags per yd. super	7 6

CAST STONE.

Delivered in London area in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Sills, 10s. 0d.

HARD WOOD.

1 INCH AND UP THICK.

Average price for prime quality.

	£ s. d.
Dry Austrian Wainscot, per ft. cube	0 17 0
Dry American and/or Japanese Figured Oak per ft. cube	10 0 to 0 12 6
Dry American and/or Japanese plain Oak, per ft. cube	0 11 6
Dry sq. edged Honduras Mahogany, per ft. cube	0 15 0
Dry log-cut Honduras Mahogany, per ft. cube	12 6 to 0 16 0
Dry Cuba Mahogany, per ft. cube	1 1 0
Dry Teak, per ft. cube	0 14 0
Dry American Whitewood, per ft. cube	0 10 6
Best Scotch Glue, per cwt.	3 0 0
Liquid Glue, per cwt.	4 7 0 to 5 10 0

SOFT WOOD.

GOOD BUILDING DEAL.

Inches.	Per stan.	Inches.	Per stan.
4 × 11	£26 10	3 × 6	£22 10
4 × 9	26 10	3 × 11	26 10
4 × 8	24 10	2 × 11	26 10
4 × 7	24 10	3 × 9	23 10
3 × 8	22 10	2½ × 9	23 10
3 × 7	22 10	3 × 4½	22 0
2½ × 7	22 10	3 × 4	22 0

PLANED BOARDS.

1 × 11	£6 10	1 × 9	£25 0

PLAIN EDGE FLOORING.

Inches.	Per sq.	Inches.	Per sq.
⅝	17/-	1¼	28/-
⅞	20/-	1½	35/-
1	22/-		

TONGUED AND GROOVED FLOORING. Inches.	Per sq.	MATCHING (BEST). Inches.	Per sq.
		⅝	18/-
1	22/6	¾	20/-
1¼	29/-	1	26/-
1½	36/-		

Ins. BATTENS.	s. d.	SAWN LATHS.	s. d.
¾ × 2 per 100 ft.	2 6	Per bundle	2 6

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	31 5 0	18 by 10	16 10 0
22 by 12	26 5 0	18 by 9	14 17 6
22 by 11	23 12 6	16 by 10	14 7 6
20 by 12	23 2 0	16 by 8	11 6 0
20 by 10	20 15 0		

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. Per 1,000 f.o.r. London.

Best machine-made tiles from Broseley or Staffordshire district	£4 2 6
ditto hand-made ditto	4 17 6
Hip and valley tiles (per dozen) { Hand-made	0 8 6
{ Machine-made	0 8 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION, PER TON—

R.S. Joists, cut and fitted	£16 10 0
Plain Compound Girders	19 10 0
„ „ Stanchions	21 5 0
In Roof Work	25 0 0

MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£ s. d.	Diameter	£ s. d.
⅛ in.	17 12 6	⅝in. to ½ in.	16 2 6
¾ in.	16 12 6	⅝ in. to 2¾ in.	15 12 6

WROUGHT-IRON TUBES AND FITTINGS—

(Discount off List for lot of not less than £10 net value delivered direct from Works, 2½ per cent. less above gross discounts, carriage forward, if sent from London Stocks.)

	Standard Wrot. Mild Steel Tubes. and Tubulars. Sizes. ⅛in. to ⅜in. %	Sizes. ½in. to 2in. %	Standard Flanges. Sizes. ½in. to 2in. %	Standard Fittings. %
Gas	60	65	62½	58½
Water	57	62½	62½	55
Steam	53½	58½	51½	50
Gal. gas	50	55	51½	48½
Galv. water	45	50	43½	43½
Galv. steam	38½	43½	38½	40

C.I. HALF-ROUND GUTTERS—London Price ex Works.

Per yd. in 6 ft. lengths.	Gutters.	Angles and Nozzles.	Stop Ends.
3 in.	1/9½	1/8	7d.
3½ in.	2/1	2/-	8½d.
4 in.	2/1	2/-	8½d.
4½ in.	2/2½	2/1	9d.
5 in.	2/4½	2/4	10d.

O.G. GUTTERS.

3 in.	2/1	2/-	8½d.
3½ in.	2/3½	2/2	9½d.
4 in.	2/5	2/4	10½d.
4½ in.	2/6	2/5	1/0½
5 in.	2/10	2/9	1/2½

RAIN WATER PIPES, &c.

Per yd. in 6 fts.	Pipe	Bends, stock Branches angles, stock angles.	
2 in.	2/8½	1/8	2/5½
2½ in.	2/9½	1/11	2/11½
3 in.	3/8	2/4½	3/7½
3½ in.	4/1	2/10½	4/1½
4 in.	4/9½	3/5	5/-

Less 20 per cent. trade discount.

Tonnage allowance—4-ton lots, 5 per cent. 2-ton lots, 2½ per cent.

L.C.C. COATED SOIL PIPES—London Prices ex Stock,

	Bends, Pipe. s. d.	stock angles. s. d.	Branches. stock angles. s. d.
2 in. per yd. in 6 fts.	3 5	2 5	2 11
2½ in. „ „	3 10	2 8	3 8
3 in.	4 2	2 11	4 4
3½ in.	4 7	3 8	5 0
4 in. „ „	5 1	4 0	5 10

L.C.C. COATED DRAIN PIPES.—London Prices, ex Stock

	Pipe. s. d.	Bends, stock Branches. angle, stock angles. s. d.	s. d.
3 in. per yd. in 9ft. lengths cwt.qr.lbs.	4 9	5 4	8 9
4 in. „	1 1 20	6 9	6 3 11 0
5 in. „	1 2 22	8 4	11 0 16 11
6 in. „	2 0 6	10 0	12 11 21 3

Gaskin for jointing 45/- per cwt.

IRON—	Per ton. £ s. d.	London. £ s. d.
Common Bars	12 15 0 ..	13 15 0
Staffordshire Crown Bars—		
Good merchant quality	14 10 0 to	16 0 0
Staffordshire Marked Bars	18 0 0 ..	19 0 0
Mild Steel Bars	12 18 0 ..	13 18 0
Steel Bars, Ferro-Concrete quality, basic price	14 8 0 ..	15 8 0
Hoop iron, basic prices	14 8 0 ..	15 8 0
„ Galvanised	24 8 0 ..	26 8 0
Soft Steel Sheets, Black—		
Ordinary sizes to 20 g.	16 5 0 ..	17 5 0
„ „ 24 g.	17 5 0 ..	18 5 0
„ „ 26 g.	18 5 0 ..	19 5 0
Sheets, Flat, Best Soft Steel, C. R. and C. A. quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 22 g. and 24 g.	17 10 0 ..	18 10 0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 26 g.	19 10 0 ..	20 10 0
No 1 quality £4 per ton extra.		
Flat and Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 9 ft. to 20 g.	18 15 0 ..	20 15 0
Ordinary sizes, 6 ft. to 9 ft. to 22 g. and 24 g.	19 5 0 ..	22 15 0
Ordinary sizes, 6 ft. to 9 ft. to 26 g.	21 5 0 ..	23 5 0
Sheets, Galvanised, Flat, Best quality—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	19 15 0 ..	22 15 0
Best Soft Steel Sheets, 22 g. and 24 g.	20 15 0 ..	22 5 0
Best Soft Steel Sheets, 26 g.	22 5 0 ..	23 5 0
Cut Nails, 3 in. to 6 in.	19 10 0 ..	21 10 0

(Under 3 in. usual trade extras.)

PAINTS, &c.

	£ s. d.
Raw Linseed Oil, in pipes per gallon	0 2 7
„ „ „ in barrels „	0 2 9
„ „ „ in drums „	0 2 11
Boiled „ „ in barrels. „	0 3 0
„ „ „ in drums „	0 3 2
Turpentine, in barrels „	0 3 2
„ in drums (10 gals.) „	0 3 4
Genuine Ground English White Lead, per ton (In not less than 5-cwt. casks.)	49 0 0

Extra for 1-cwt. kegs over 5-cwt. casks is 2/9 cwt.

GENUINE WHITE LEAD PAINT.

	£ s. d.
"Father Thames," "Nine Elms," and other best brands (in 14-lb. tins) not less than 5-cwt. lots. per ton delivered	68 0 0
Red Lead, Dry (packages extra) per ton	38 0 0
Best Linseed Oil Putty per cwt.	0 14 9
Size. XD quality ton	0 3 6

VARNISHES, &c.

	per gallon
Oak Varnish Outside	0 14 0
Fine do. „	0 16 0
Fine Copal „	0 18 0
Pale Copal „	1 0 0
Best Japan Gold Size	1 12 6
Best Black Japan	0 10 0
Knotting (patent)	0 15 0
Liquid Dryers in Terebene	0 9 0

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

ORDINARY GLAZING QUALITY AND SELECTED GLAZING QUALITY.

per ft. super.	per ft. super
18 oz. O.Q. 2½d.	32 oz. O.Q. 5½d.
24 „ O.Q. 3½d.	Obscured Sheet, 18 oz. 3d.
26 „ O.Q. 3½d.	24 „ 4½d.
	„ „ Fluted 21 „ 9d.

Extra price according to size and substance fir squares cut from stock.

ENGLISH ROLLED PLATE AND FIGURED CATHEDRAL, ETC., IN CUT SIZES.

	Per ft. s. d.
Rolled plate, ¼ in.	5½d.
Rough cast double rolled, ⅜in.	6½d.
Rough cast double rolled, ¼ in.	6½d.
Figured rolled, etc., white	6½d.
Figured, rolled, etc., tinted	9½d.
Rolled Sheet	6d.
White rolled cathedral	6½.
Tinted rolled cathedral	8½d.

Rolled Plate is the same price as rough cast double rolled.

	Per ft. s. d.
Reeded, Broad Reeded, Cross Reeded and Chevron Reeded, ⅛ in. thick	0 10½
Wire Rolled, ⅛-in. thick	0 9½
Wired cast, ⅛ in. thick	0 9½
"Calores" Cast, ⅛ in. thick	0 10
„ „ ¼ in. „	1 2

LEAD, &c.

(Delivered in London.)	Per ton. £ s. d.
LEAD.—Sheet, English, 4 lb. and up	22 10 0
Pipe in coils	22 0 0
Soil pipe	27 10 0
Compo pipe	29 5 0

NOTE.—Country delivery, 20/- per ton extra, lots under 3 cwt. 4/- per cwt. extra and over 3 cwt. and under 5 cwt., 2/6 per cwt. extra. Cuty to sizes, 4/- per cwt. extra.

Old lead, ex London area, at Mills per ton	£12 5 0.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

MARCH, 1939, PRICES FOR BUILDING WORK IN LONDON.

Note.—These prices apply to new buildings only. They cover superintendence by foreman and carry a profit of 10 per cent. on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployment Acts, and from 1s. 6d. per £100 Fire Insurance. The whole of the information given is copyright.

		£	s.	d.
PRELIMINARIES.				
Hoardings, with suitable gate, 8 ft. high	per ft. run	0	3	0
Steel scaffolding for brickwork	per sqre.	1	5	0
Steel scaffolding for stone building	,,	1	10	0
Steel gantry for stone building	per ft. run	2	10	0
Office, shed for cement and mess-room	say	75	0	0
EXCAVATOR.				
Digging, throwing out and filling into carts and carting to shoot, 5 ft. deep	per yd. cube	0	7	9
Add if stiff clay	,,	0	1	0
Add for every additional 5 ft.	,,	0	0	6
Add if in trenches	,,	0	0	9
Add to price of digging for breaking up concrete foundation and brickwork	,,	0	10	0
Return, fill and ram	,,	0	1	9
Fill into carts and cart away	,,	0	3	6
Planking and strutting to trenches	per ft. super	0	0	3½
Planking and strutting to sides of basement excavation next roadway	,,	0	1	4
Needling, flying and raking shores and removing after and carting away	per ft. cube	0	0	9
CONCRETOR.				
Portland cement and ballast concrete 1-6 in. foundations	per yd. cube	1	2	0
Add in underpinning in short lengths	,, ,,	0	6	0
Concrete in floors, ¾ in. aggregate, and sand, 1-2-4—				
4 in. thick	per yd. super	0	3	4
6 in. thick	,, ,,	0	4	8
Add if trowelled smooth	,, ,,	0	0	9
Add for hoisting, each floor	,, ,,	0	0	3
Concrete 1-2-4 in. beams and stanchions	per ft. cube	0	1	4
Concrete in lintols, with steel rod reinforcement each 4½ in. width and shuttering	,, ,,	0	4	0
1½ in. centering, with stout supports for concrete floors	per square	2	2	0
Do. to sides and soffites of beams	per ft. super	0	0	8
Do. to sides of stanchions	,, ,,	0	0	7
Steel rod reinforcement under ¾ in. diameter, cut, bent and placed in position	per cwt.	1	8	0
Do. do. over ¾ in. diameter	,,	1	5	0
BRICKWORK.				
Reduced to 1½ brick in flettons, lime mortar	per rod	26	0	0
Add for 2nd hard stocks	,,	8	0	0
Add for Blue Staffordshire	,,	22	0	0
Add to above if in 1-4 cement	,,	0	15	0
Add if in backing to stonework	,,	1	5	0
Add if in underpinning in cement	,,	4	10	0
Add if above 40 ft. to 60 ft. high	,,	2	0	0
SUNDRIES.				
Damp course in double course of slates, breaking joint	per ft. super	0	0	11
Vertical do. do.	,,	0	1	2
Bitumastic	,,	0	0	5
Lead core	,,	0	0	10
Cut, tooth and bond new to old brickwork	,,	0	1	0
Rake out joints of brickwork	,,	0	0	1
Leave chase for concrete floor	per ft. run	0	0	2
Cut chase 4½ in. deep for concrete floor	,,	0	1	2
Leave chase for vertical pipe	,,	0	0	4
Cut chase for vertical pipe	,,	0	1	4
Rake out joint for flashings and point	,,	0	0	2
Do. stepped do.	,,	0	0	4
Do. for asphalt skirting	,,	0	0	2
Build in ends of timbers	each	0	0	4
Do. steel joists up to 12 in. deep	,,	0	0	6
Do. step and make good facings	,,	0	1	6
Set and flaunch chimney pots	,,	0	7	6
Render fire openings	,,	0	2	0
Bed and point door frames one side	,,	0	3	0
Do. both sides	,,	0	4	6
Do. window frames, one side	,,	0	4	0
Setting only register grate	,,	1	0	0
Do. interior hearths and mantles	,,	1	15	0
Do. kitchen range, large	,,	5	0	0
Fix air brick and form flue	,,	0	2	0
Cut holes for pipes and make good facings, 9 in. wall	,,	0	2	0
Do. do. 13½ in. wall	,,	0	2	6
Do. large pipes and do. 9 in. wall	,,	0	3	0
Do. do. 13½ in. wall	,,	0	3	6
FACINGS.				
Extra for facings in Flemish bond for each 10s. per thousand over the price of Flettons	per ft. super	0	1½	
Pointing facings to approval	,,	0	3	
Arches extra over Flettons in stocks	,,	0	8	
Do. in reds	,,	1	0	
Do rubbed and gauged in putty	,,	5	9	

		£	s.	d.
PARTITIONS.				
2 in. breeze slab partitions in cement	per yd. super	4	0	
3 in. do. do.	,,	4	6	
2 in. hollow-tile do.	,,	4	9	
3 in. do. do.	,,	5	6	
PAVING.				
1 in. granolithic paving gauged 5—2	per yd. super	2	7	
1½ in. do. do.	,,	2	11	
1 in. × 6 in. covered skirting	per ft. run	0	10	
ASPHALT (NATURAL).				
½ in. horizontal damp course	per ft. super	0	6	
¾ in. horizontal damp course	,,	0	8	
¾ in. vertical do. in two layers	per yd. super	9	6	
¾ in. in flats, two layers	,,	6	0	
Angle fillet	per ft. run	0	3	
6 in. skirting and angle fillet and jointing top edge	,,	1	0	
DRAINAGE.				
Excavate, trench for drain and throw out, return, fill and ram, and including any planking and strutting required, and cart away surplus earth per ft. run	1 ft. deep	0	5	
	2 ft. deep	0	10	
	3 ft. deep	1	3	
	4 ft. deep	1	8	
	5 ft. deep	4	2	
	6 ft. deep	5	0	
	7 ft. deep	5	10	
	8 ft. deep	6	8	
4 in. best quality glazed stoneware drain pipe, socketed joints, yarn and neat cement, on and including cement concrete bed, 18 in. wide and 6 in. thick, and benched up on each side of pipe	per ft. run	2	4	
6 in. do. do. do. but concrete bed 20 in. and 6 in. thick	,,	3	0	
9 in. do. do. do. but concrete bed 23 in. wide and 6 in. thick	,,	4	11	
Extra for 4 in. bends	each	2	6	
Do. 6 in. ,,	,,	3	6	
Do. 9 in. ,,	,,	5	6	
Extra for 4 in. junctions	,,	2	9	
Do. 6 in. ,,	,,	3	9	
Do. 9 in. ,,	,,	6	0	
4 in. stoneware gully, encased in concrete and making good granolithic paving	,,	13	0	
6 in. do.	,,	14	0	
9 in. do.	,,	18	6	
4 in. stoneware interceptor, and surround with concrete	,,	1	5	0
6 in. do.	,,	1	10	0
9 in. do.	,,	2	10	0
IRON DRAINS.				
4 in. C.I. drain and laying and jointing in molten lead	per ft. run	3	4	
6 in. do. do.	,,	5	0	
Extra for 4 in. bends	each	10	0	
Extra for 6 in. bends	,,	18	0	
Extra for 4 in. junctions	,,	17	6	
Extra for 6 in. junctions	,,	30	0	
MASON.				
Bath stone and all labour, fixed	per ft. cube	10	9	
Portland stone and all labour, fixed	,, ,,	17	9	
York stone templates, fixed	,, ,,	12	6	
York stone steps, fixed	,, ,,	16	0	
York stone cills, fixed	,, ,,	1	2	0
SLATER.				
24 × 12 Bangor slates laid to 3 in. lap secured with zinc nails	per square	3	15	6
20 × 10 do. do.	,,	3	13	6
16 × 8 do. do.	,,	3	11	6
Extra to eaves course	per ft. run	0	9	
Extra to top edge and square abutments	,,	0	4½	
Extra to verge and labour only, bedding and pointing	,,	0	7½	
Raking, cutting and waste	,,	0	7	
Half-round red ridge tile	,,	1	2	
Half-round blue ridge tile	,,	1	8	
Fixing only soakers	per dozen	0	9	
Red hand-made sand-faced tiles laid to 4 in. gauge, nailed every fifth course with galvanised iron nails	per square	3	0	0
Extra to eaves course	per ft. run	0	5	
Extra to top edge and square abutments	,, ,,	0	3½	
Extra to verge and bed and point	,, ,,	0	11	
Half-round ridge	,, ,,	1	4	
Bonnet hips, including cutting and waste (both sides)	,, ,,	3	8	
Valley tiles, including cutting and waste (both sides)	,, ,,	3	6	
Fixing only soakers	per dozen	0	9	

MARCH, 1939, PRICES FOR BUILDING WORK IN LONDON.—continued.

CARPENTER AND JOINER.

		s. d.
Fir framed in plates	per ft. cube	4 0
Do. joints	„ „	4 6
Do. roofs, etc.	„ „	5 3
Do. trusses	„ „	6 9

		¾in.	1in.	1¼in.
Deal rough close boarding	per sq.	32/-	38/-	47/-
Battens for slating	„	10/-	11/-	12/-

		s. d.
Centre for arches	per ft. super	1 6
Gutter boards and bearer	„ „	1 0

FLOORING.

		¾in.	1in.	1¼in.	1½in.
Deal edges shot	per sq.	—	41/-	49/-	58/-
Do. tongued and grooved	„	—	46/-	55/-	67/-
Do. matchings	„	42/-	47/6	—	—
Moulded skirtings, including backings and grounds	per ft. super	1/4	1/7	1/9	2/3
Mitres	each	-/6	-/8	-/9	1/-
Stop ends	„	-/3	-/4	-/4	-/6

SASHES AND FRAMES.

		s. d.
One-and-a-half in. moulded sashes	per ft. super	1 9
Two in. do. do.	„ „	2 0
Add for fitting and fixing	„ „	0 2
Deal cased frames, 1 in. linings, 1¼ in. pulley, and stiles, 2 in. moulded sashes, in squares, hardwood cill, double hung with pulleys, lines and weights, average size	„ „	3 3

DOORS.

		1½in.	1¾in.	2in.
Two-panel square framed	per ft. super	2 1	2 3	2 5
Four-panel do.	„ „	2 4	2 6	2 9
Two-panel moulded both sides	„ „	2 6	2 9	2 11
Four-panel do. do.	„ „	2 9	2 11	3 2

		£	s.	d.
Flush doors. 1¼ in. to 2 in. finished thickness skeleton core, covered each side with Columbian pine ply, solid pine edging, 2 ft. 6 in. by 6 ft. 6 in.	each	1	15	0
Do., covered with Gaboon mahogany ply, solid mahogany edging, 2 ft. 6 in. by 6 ft. 6 in.	„	2	0	0
Solid core, all as first item	„	2	0	0
Solid core, all as second item	„	2	5	0
Shaped peep holes, 4 sided	„	0	5	0
Hexagonal holes	„	0	6	0
Circular holes	„	0	7	0

FRAMES.

		s. d.
Deal wrot moulded and rebated	per ft. cube	12 0
Hardwood do. do.	„ „	36 0

		1in.	1¼in.	1½in.
Plain deal jamb linings, framed	per ft. super	1 7	1 8	1 11
Deal shelves and bearers	„ „	1 2	1 4	1 7
Add if cross-tongued	„ „	-/2	-/2	-/2
Deal window board, tongued to oak, cill and bearers	„ „	1 6	1 9	2 0
Deal moulding, tongued and grooved to window board	per ft. run			0 6

SUNDRIES.

		s. d.
Deal architrave, including mitres per sectional inch	per ft. run	0 1
Glazing beads, deal fixed	„ „	0 2
Do. fixed with brass screws and cups	„ „	0 4
Rebate	„ „	0 0½
Groove	„ „	0 0½
Notching	„ „	0 2
Tongued and grooved angle	„ „	0 3½
Rounded heel and hollow	„ „	0 2½

STAIRCASES.

		1in.	1¼in.	1½in.	2in.
Deal treads and risers on and including rough brackets	per ft. super	2/-	2/3	2/8	—
Deal strings, wrot and framed	„ „	—	—	2/2	2/8

		s. d.
Housings	each	0 9
Mahogany handrail, average 3 in. x 3 in.	per ft. run	5 6
Add if ramped	„ „	11 0
Add if wreathed	„ „	1 2 0

FIXING ONLY IRONMONGERY.

	s. d.
Barrel bolts	0 8
Sash fasteners	1 0
Casement fasteners	1 2
Casement stays	1 2
Flush bolts	1 6
Cupboard locks	1 6
Rim locks and furniture	2 0
Mortice locks and furniture	4 0
Floor springs, including oil	20 0
Overhead springs	5 0

FOUNDER AND SMITH.

		s. d.
Rolled steel joists	Per cwt.	19 6
Compound girders	„	22 6
Stanchions	„	24 3
Roofwork	„	29 6

RAINWATER GOODS.

		3 in.	4 in.	5 in.	6 in.
Half-round eaves gutters and fixing	per ft. run	1/3	1/4	1/10	1/11
Ogee do. do	„ „	1/5	1/6	2/1	2/9
R.W. pipe and fixing	„ „	1/7	2/1	—	—
Extra for shoes and bends	each	3/3	4/6	—	—
Do. stopped ends	„	1/3	1/7	2/-	3/-
Do. nozzles and angles	„	2/7	3/-	4/2	4/8

PLUMBER.

		s. d.
Milled lead and laying in flashings and gutters	per cwt.	38 0
Do. in flats	„	36 6
Extra labour and solder in cesspools	each	6 0
Welt joint	per ft. run	0 4
Soldered seam	„ „	1 6
Copper nailing—close	„ „	0 3
Do. do. open	„ „	0 2
Soldered dots	each	2 0
Bossed ends to rolls	„	0 6

	½in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	4 in.
Lead overflow per ft. run	-/8½	1/-	1/6	1/9	2/1	2/9	—
„ service „	1/2	1/9	2/8	3/6	4/-	5/3	—
„ soil „	—	—	—	—	—	—	6/-
Bends in pipe each	—	—	—	—	1/9	2/-	5/6
Wiped solder joints „	1/9	2/3	2/6	3/-	3/4	4/-	5/9
Lead traps and cleaning screws „	—	—	—	6/6	9/6	—	—
Stopcocks and joints „	11/-	14/-	18/-	—	—	—	—

PLASTERER.

		s. d.
Render, float and set in lime and hair	per yd. super	2 0
Do. narrow widths	per ft. super	0 4
Do. and set with Sirapite	per yd. super	2 3
Do. narrow widths	per ft. super	0 4
Do. and set with Keenes	per yd. super	3 0
Do. narrow widths	per ft. super	0 5½
Add sawn lathing	per yd. super	1 4
Add metal lathing (not including hangers or runners for suspended ceilings)	„ „	2 4
Portland cement screed	„ „	1 7
Do. plain face	„ „	3 3
Mouldings in plaster	per 1 in. girth	0 1½

GLAZIER.

		s. d.
24 oz. sheet	per ft. super	0 7½
26 oz. sheet	„ „	0 8
24 oz. Obscured sheet	„ „	0 8½
Double Cathedral	„ „	0 9½
Majestic	„ „	0 10
Flemish	„ „	0 10
Pinhead Morocco	„ „	0 10
¼ in. rough rolled or cast plate	„ „	0 10½
¼ in. wired cast plate	„ „	1 1½

PAINTER.

		s. d.
Preparing and distempering, two coats	per yd. super	0 7½
Knotting and priming	„ „	0 7
Plain painting, one coat	„ „	0 9
Do. two coats	„ „	1 2
Do. three coats	„ „	1 9
Do. four coats	„ „	2 4
Graining	„ „	2 5
Varnishing, twice	„ „	1 9
Sizing	„ „	0 3
Flatting	„ „	0 7
Enamel	„ „	1 1
Wax polishing	per ft. super	0 6
French polishing	„ „	1 2
Preparing for and hanging paper	per piece	2/- to 4/-

ECONOMY IN CEMENT

From a Correspondent.

A PUBLICATION of the Department of Scientific and Industrial Research, "Economy in the Use of Cement," is a reminder of the way in which cement is frequently wasted, particularly in small works where the builder has not kept up to date or tolerates inferior workmanship. It would serve a useful purpose if it were widely distributed amongst the many small builders who still follow out-of-date and wasteful practice.

It is still common to see 1 : 4 mixes of Portland cement and aggregate used in footings, garden paths, and similar work because these proportions were used forty years ago. The increased strength of Portland cement is ignored. No account is taken of the cleanliness and better grading of aggregates purchased from reputable suppliers. Better cement and better aggregates are used, and, if the mixing, placing, and curing were done properly forty years ago and are still done properly, the builder is getting much stronger—and unnecessarily strong—concrete without realising the fact. Money and cement are being wasted.

The same remarks apply to mortar. A builder frequently uses Portland cement mortar for brickwork when lime mortar would give a better job; again, money and Portland cement are being wasted in joints which are unnecessarily strong.

Another source of waste is in unnecessary thicknesses. It is still common to see private garage floors made 6 in. and even 8 in. thick, when as often as not 2 in. would be quite sufficient, provided the base is well consolidated. It is cheaper to lay and roll a few inches of ashes than to mix and place 4 in. of concrete—and a great deal of cement would be saved. For many jobs such as car parks, garages, footpaths, etc., 2-in. concrete paving flags laid on 2 in. of ashes is a suitable form of construction, and if the flags are bought from stock no demand at all is made on cement supplies.

A point which is not touched on by the Department is the increased strength that can be obtained with leaner mixes by paying more attention to the cleanliness and grading of the aggregates and the water content, the mixing and placing of the concrete, and its curing during the hardening period. This subject is, however, dealt with in War Time Bulletin No. 9. It is well known that the addition of a gallon of water more than is necessary to give a workable mix weakens the concrete to the same extent as the omission of a gallon of cement. Indifferent mixing will produce a concrete in which the cement is not evenly distributed, again resulting in loss of strength. If the aggregates are poorly graded, the voids will be filled with cement paste; it is cheaper and more economical of cement to fill these voids with stone and sand. Even if the water content, grading and mixing have been properly attended to, a weak and honeycombed concrete will be made unless the material is thoroughly consolidated in the shuttering, and all precautions can to some extent be nullified if the concrete is allowed to dry out or to become frozen before it has hardened.

Rules for Saving Cement.

The essentials to aim at are: (1) Density, to give strong and durable concrete; (2) sufficient strength for the purpose for which it is required with the smallest quantity of cement; (3) workability, to enable the mix to be easily placed and properly compacted. If the principles which govern the production of strong concrete are observed, a saving in cement will naturally follow.

To obtain the strongest concrete it is necessary to use the various sizes of materials in such proportions that all the interstices in the mass are filled. An ideal grading for strong concrete would result in a mix so dense that there would be no voids at all; then the function of the cement would be simply to coat each particle so that it would adhere to those in juxtaposition to it. This would be not only the strongest but also the most economical mix, because any insufficiency of finer material to fill the voids in a badly graded mix has to be made up by cement, and as cement is the most expensive constituent of concrete it is wasteful to use it as a void filler.

Sources of aggregate, such as gravel pits, in which the materials are already properly graded, are rarely found, so that to obtain maximum density it may be necessary to separate the aggregates into two or more different sizes and remix them in the proportions found to produce the densest mass. Generally, it is not desirable to use an excess of fine materials because the smaller the particles in a given volume of aggregate the greater the superficial area to be coated with cement paste, and consequently more cement is necessary to bind the mass together.

Much has been written about the effect of the water content on the strength of concrete. It may, indeed, be said that too much has been published on this subject, which, after all, is a simple matter and would be more generally known if it were written about more simply and without the use of so many mathematical formulæ and expressions with which the average builder—and equally important, his foreman—are unfamiliar. Perhaps the best way to point out the effect of the water-cement-ratio on the strength of concrete is to consider the mixture not as a mixture of cement, sand, gravel and water, but as a mixture of two constituents only, namely (1) cement paste, formed by the cement and water, and (2) the aggregate, which comprises the sand, gravel, or other inert material which is to be bound together by the cement paste. Regardless of the proportions of a mix, the greater the quantity of water that is added the thinner will be the cement paste. If we add more water to glue or paste we know that its adhesive properties will be lessened, and no joiner or paperhanger would dilute his glue or paste and expect it to stick as well as if it were stronger. When adding more water he would also add more glue or flour to maintain the same strength. Yet in concrete work it is all too common to see more water added to make the material more workable without adding more cement to maintain the strength. But it is very important to remember that, whereas by adding more water as well as more glue the joiner gets a further supply of useful glue, the addition of more water and more cement does not appreciably increase the quantity of finished concrete. Too little or too much mixing water are both wasteful, the former by preventing the cement from developing its full strength and the latter by calling for more cement to produce the same amount of concrete and the same strength as could be obtained with a leaner and drier mix. The driest concrete that can be used in any particular work is always the cheapest so long as sufficient water is present to hydrate the cement.

Every endeavour should be made to prevent waste. Cement bags should not be emptied so that part of the contents blows away. The material must be kept under cover to prevent its being spoilt by rain. No more concrete should be mixed than can be used—it is stupid as well as expensive to throw away mixed or set concrete. Concrete laid out of doors must be protected during frost and rain so that its surface will not be spoilt and require a topping. And paper bags should be stored under cover and disposed of to waste-paper merchants.

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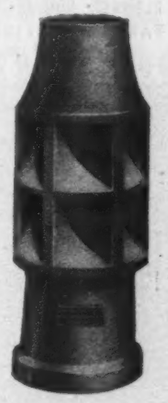

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THE VENTAMATT DOWNDRAUGHT PREVENTING CHIMNEY POT

46-17

EMERGENCY INQUIRY BUREAU

Repair of Air Raid Damage: Disagreement as to Cost.

SIR,—*We shall be grateful if you can assist us in the following matter:—*

Owing to enemy action during an air raid, damage was caused to a farmhouse and buildings owned by one of our clients. Our estimate of the cost of reinstatement was £1,600, which figure was entered on the V.O.W.1 form and forwarded to the District Valuer. We also instructed a firm of architects and quantity surveyors to survey the damage and prepare a priced bill of quantities based upon present-day costs, this figure being £1,500.

The District Valuer engaged a local architect as his assessor, whose estimate of the damage was £825, based upon March, 1939, costs. Our architect disagreed with this figure. The assessor then paid a further visit to the site and amended his estimate to £950, which our architect would not agree to.

We then instructed our architect and quantity surveyor to prepare a priced bill of quantities based on March, 1939, costs, so that all figures should be on the same basis; this figure was £1,150. A copy of the quantities was forwarded to the District Valuer, who has now written the following:—

"Your bill of quantities has been carefully checked through, and I see no reason to alter my offer of £950, as I am advised that your prices are high for this class of work. If you cannot advise your client to accept the offer I made I must reopen the whole question and consider whether the cost of reinstatement exceeds the diminution of the market value of the property; if so, of course, the latter course will have to be applied."

It would appear from the second paragraph of the District Valuer's letter that unless we accept the assessor's figure we are threatened with other means of assessing the claim. Is this in order? Is it not possible for the matter to be referred to a higher authority, or to arbitration? If so, to whom should we apply? READERS.

A contributor writes as follows:—

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MARCH, 1939, PRICES FOR BUILDING WORK IN LONDON.—continued.

CARPENTER AND JOINER.

		s. d.
Fir framed in plates	per ft. cube	4 0
Do. joints	„ „	4 6
Do. roofs, etc.	„ „	5 3
Do. trusses	„ „	6 9

		¾in.	1in.	1¼in.
Deal rough close boarding	per sq.	32/-	38/-	47/-
Battens for slating	„	10/-	11/-	12/-
Centre for arches	per ft. super			1 6
Gutter boards and bearer	„ „			1 0

FLOORING.

		¾in.	1in.	1¼in.	1½in.
Deal edges shot	per sq.	—	41/-	49/-	58/-
Do. tongued and grooved	„	—	46/-	55/-	67/-
Do. matchings	„	42/-	47/6	—	—
Moulded skirtings, including backings and grounds	per ft. super	1/4	1/7	1/9	2/3
Mitres	each	-/6	-/8	-/9	1/-
Stop ends	„	-/3	-/4	-/4	-/6

SASHES AND FRAMES.

		s. d.
One-and-a-half in. moulded sashes	per ft. super	1 9
Two in. do. do.	„ „	2 0
Add for fitting and fixing	„ „	0 2
Deal cased frames, 1 in. linings, 1¼ in. pulley, and stiles, 2 in. moulded sashes, in squares, hardwood cill, double hung with pulleys, lines and weights, average size	„ „	3 3

DOORS.

		1¼in.	1½in.	2in.
Two-panel square framed	per ft. super	2 1	2 3	2 5
Four-panel do.	„ „	2 4	2 6	2 9
Two-panel moulded both sides	„ „	2 6	2 9	2 11
Four-panel do. do.	„ „	2 9	2 11	3 2

		£	s. d.
Flush doors. 1¼ in. to 2 in. finished thickness skeleton core, covered each side with Columbian pine ply, solid pine edging, 2 ft. 6 in. by 6 ft. 6 in.	each	1	15 0
Do., covered with Gaboon mahogany ply, solid mahogany edging, 2 ft. 6 in. by 6 ft. 6 in.	„	2	0 0
Solid core, all as first item	„	2	0 0
Solid core, all as second item	„	2	5 0
Shaped peep holes, 4 sided	„	0	5 0
Hexagonal holes	„	0	6 0
Circular holes	„	0	7 0

FRAMES.

		s. d.
Deal wrot moulded and rebated	per ft. cube	12 0
Hardwood do. do.	„ „	36 0

		1in.	1¼in.	1½in.
Plain deal jamb linings, framed	per ft. super	1 7	1 8	1 11
Deal shelves and bearers	„ „	1 2	1 4	1 7
Add if cross-tongued	„ „	-/2	-/2	-/2
Deal window board, tongued to oak, cill and bearers	„ „	1 6	1 9	2 0
Deal moulding, tongued and grooved to window board	per ft. run			0 6

SUNDRIES.

		s. d.
Deal architrave, including mitres per sectional inch	per ft. run	0 1
Glazing beads, deal fixed	„ „	0 2
Do. fixed with brass screws and cups	„ „	0 4
Rebate	„ „	0 0½
Groove	„ „	0 0½
Notching	„ „	0 2
Tongued and grooved angle	„ „	0 3½
Rounded heel and hollow	„ „	0 2½

STAIRCASES.

		1in.	1¼in.	1½in.	2in.
Deal treads and risers on and including rough brackets	per ft. super	2/-	2/3	2/8	—
Deal strings, wrot and framed	„ „	—	—	2/2	2/8
Housings	each				0 9
Mahogany handrail, average 3 in. x 3 in.	per ft. run				5 6
Add if ramped	„ „				11 0
Add if wreathed	„ „			1	2 0

FIXING ONLY IRONMONGERY.

	s. d.
Barrel bolts	0 8
Sash fasteners	1 0
Casement fasteners	1 2
Casement stays	1 2

FIXING ONLY IRONMONGERY—*continued.*

	s. d.
Flush bolts	1 6
Cupboard locks	1 6
Rim locks and furniture	2 0
Mortice locks and furniture	4 0
Floor springs, including oil	20 0
Overhead springs	5 0

FOUNDER AND SMITH.

		s. d.
Rolled steel joists	Per cwt.	19 6
Compound girders	„	22 6
Stanchions	„	24 3
Roofwork	„	29 6

RAINWATER GOODS.

		3 in.	4 in.	5 in.	6 in.
Half-round eaves gutters and fixing	per ft. run	1/3	1/4	1/10	1/11
Ogee do. do	„ „	1/5	1/6	2/1	2/9
R.W. pipe and fixing	„ „	1/7	2/1	—	—
Extra for shoes and bends	each	3/3	4/6	—	—
Do. stopped ends	„	1/3	1/7	2/-	3/-
Do. nozzles and angles	„	2/7	3/-	4/2	4/8

PLUMBER.

		s. d.
Milled lead and laying in flashings and gutters	per cwt.	38 0
Do. in flats	„	36 6
Extra labour and solder in cesspools	each	6 0
Welt joint	per ft. run	0 4
Soldered seam	„ „	1 6
Copper nailing—close	„ „	0 3
Do. do. open	„ „	0 2
Soldered dots	each	2 0
Bossed ends to rolls	„	0 6

	½in.	¾in.	1in.	1¼in.	1½in.	2in.	4in.
Lead overflow per ft. run	-/8½	1/-	1/6	1/9	2/1	2/9	—
„ service „	1/2	1/9	2/8	3/6	4/-	5/3	—
„ soil „	—	—	—	—	—	—	6/-
Bends in pipe each	—	—	—	—	1/9	2/-	5/6
Wiped solder joints „	1/9	2/3	2/6	3/-	3/4	4/-	5/9
Lead traps and cleaning screws „	—	—	—	6/6	9/6	—	—
Stopcocks and joints „	11/-	14/-	18/-	—	—	—	—

PLASTERER.

		s. d.
Render, float and set in lime and hair	per yd. super	2 0
Do. narrow widths	per ft. super	0 4
Do. and set with Sirapite	per yd. super	2 3
Do. narrow widths	per ft. super	0 4
Do. and set with Keenes	per yd. super	3 0
Do. narrow widths	per ft. super	0 5½
Add sawn lathing	per yd. super	1 4
Add metal lathing (not including hangers or runners for suspended ceilings)	„ „	2 4
Portland cement screed	„ „	1 7
Do. plain face	„ „	3 3
Mouldings in plaster	per 1 in. girth	0 1½

GLAZIER.

		s. d.
24 oz. sheet	per ft. super	0 7½
26 oz. sheet	„ „	0 8
24 oz. Obscured sheet	„ „	0 8½
Double Cathedral	„ „	0 9½
Majestic	„ „	0 10
Flemish	„ „	0 10
Pinhead Morocco	„ „	0 10
⅛ in. rough rolled or cast plate	„ „	0 10½
¼ in. wired cast plate	„ „	1 1½

PAINTER.

		s. d.
Preparing and distempering, two coats	per yd. super	0 7½
Knotting and priming	„ „	0 7
Plain painting, one coat	„ „	0 9
Do. two coats	„ „	1 2
Do. three coats	„ „	1 9
Do. four coats	„ „	2 4
Graining	„ „	2 5
Varnishing, twice	„ „	1 9
Sizing	„ „	0 3
Flatting	„ „	0 7
Enamel	„ „	1 1
Wax polishing	per ft. super	0 6
French polishing	„ „	1 2
Preparing for and hanging paper	per piece	2/- to 4/-

ECONOMY IN CEMENT

From a Correspondent.

A PUBLICATION of the Department of Scientific and Industrial Research, "Economy in the Use of Cement," is a reminder of the way in which cement is frequently wasted, particularly in small works where the builder has not kept up to date or tolerates inferior workmanship. It would serve a useful purpose if it were widely distributed amongst the many small builders who still follow out-of-date and wasteful practice.

It is still common to see 1 : 4 mixes of Portland cement and aggregate used in footings, garden paths, and similar work because these proportions were used forty years ago. The increased strength of Portland cement is ignored. No account is taken of the cleanliness and better grading of aggregates purchased from reputable suppliers. Better cement and better aggregates are used, and, if the mixing, placing, and curing were done properly forty years ago and are still done properly, the builder is getting much stronger —and unnecessarily strong—concrete without realising the fact. Money and cement are being wasted.

The same remarks apply to mortar. A builder frequently uses Portland cement mortar for brickwork when lime mortar would give a better job; again, money and Portland cement are being wasted in joints which are unnecessarily strong.

Another source of waste is in unnecessary thicknesses. It is still common to see private garage floors made 6 in. and even 8 in. thick, when as often as not 2 in. would be quite sufficient, provided the base is well consolidated. It is cheaper to lay and roll a few inches of ashes than to mix and place 4 in. of concrete—and a great deal of cement would be saved. For many jobs such as car parks, garages, footpaths, etc., 2-in. concrete paving flags laid on 2 in. of ashes is a suitable form of construction, and if the flags are bought from stock no demand at all is made on cement supplies.

A point which is not touched on by the Department is the increased strength that can be obtained with leaner mixes by paying more attention to the cleanliness and grading of the aggregates and the water content, the mixing and placing of the concrete, and its curing during the hardening period. This subject is, however, dealt with in War Time Bulletin No. 9. It is well known that the addition of a gallon of water more than is necessary to give a workable mix weakens the concrete to the same extent as the omission of a gallon of cement. Indifferent mixing will produce a concrete in which the cement is not evenly distributed, again resulting in loss of strength. If the aggregates are poorly graded, the voids will be filled with cement paste; it is cheaper and more economical of cement to fill these voids with stone and sand. Even if the water content, grading and mixing have been properly attended to, a weak and honeycombed concrete will be made unless the material is thoroughly consolidated in the shuttering, and all precautions can to some extent be nullified if the concrete is allowed to dry out or to become frozen before it has hardened.

Rules for Saving Cement.

The essentials to aim at are: (1) Density, to give strong and durable concrete; (2) sufficient strength for the purpose for which it is required with the smallest quantity of cement; (3) workability, to enable the mix to be easily placed and properly compacted. If the principles which govern the production of strong concrete are observed, a saving in cement will naturally follow.

To obtain the strongest concrete it is necessary to use the various sizes of materials in such proportions that all the interstices in the mass are filled. An ideal grading for strong concrete would result in a mix so dense that there would be no voids at all; then the function of the cement would be simply to coat each particle so that it would adhere to those in juxtaposition to it. This would be not only the strongest but also the most economical mix, because any insufficiency of finer material to fill the voids in a badly graded mix has to be made up by cement, and as cement is the most expensive constituent of concrete it is wasteful to use it as a void filler.

Sources of aggregate, such as gravel pits, in which the materials are already properly graded, are rarely found, so that to obtain maximum density it may be necessary to separate the aggregates into two or more different sizes and remix them in the proportions found to produce the densest mass. Generally, it is not desirable to use an excess of fine materials because the smaller the particles in a given volume of aggregate the greater the superficial area to be coated with cement paste, and consequently more cement is necessary to bind the mass together.

Much has been written about the effect of the water content on the strength of concrete. It may, indeed, be said that too much has been published on this subject, which, after all, is a simple matter and would be more generally known if it were written about more simply and without the use of so many mathematical formulæ and expressions with which the average builder—and equally important, his foreman—are unfamiliar. Perhaps the best way to point out the effect of the water-cement-ratio on the strength of concrete is to consider the mixture not as a mixture of cement, sand, gravel and water, but as a mixture of two constituents only, namely (1) cement paste, formed by the cement and water, and (2) the aggregate, which comprises the sand, gravel, or other inert material which is to be bound together by the cement paste. Regardless of the proportions of a mix, the greater the quantity of water that is added the thinner will be the cement paste. If we add more water to glue or paste we know that its adhesive properties will be lessened, and no joiner or paperhanger would dilute his glue or paste and expect it to stick as well as if it were stronger. When adding more water he would also add more glue or flour to maintain the same strength. Yet in concrete work it is all too common to see more water added to make the material more workable without adding more cement to maintain the strength. But it is very important to remember that, whereas by adding more water as well as more glue the joiner gets a further supply of useful glue, the addition of more water and more cement does not appreciably increase the quantity of finished concrete. Too little or too much mixing water are both wasteful, the former by preventing the cement from developing its full strength and the latter by calling for more cement to produce the same amount of concrete and the same strength as could be obtained with a leaner and drier mix. The driest concrete that can be used in any particular work is always the cheapest so long as sufficient water is present to hydrate the cement.

Every endeavour should be made to prevent waste. Cement bags should not be emptied so that part of the contents blows away. The material must be kept under cover to prevent its being spoilt by rain. No more concrete should be mixed than can be used—it is stupid as well as expensive to throw away mixed or set concrete. Concrete laid out of doors must be protected during frost and rain so that its surface will not be spoilt and require a topping. And paper bags should be stored under cover and disposed of to waste-paper merchants.

DOWNDRAUGHT PREVENTION

A postcard will bring you a copy of our latest Catalogue. Of interest and practical assistance to all connected with the Building Industry. Send now to:

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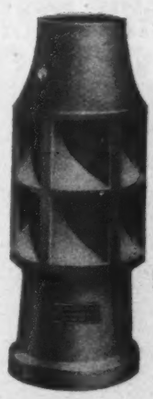

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THE VENTAMATT DOWNDRAUGHT PREVENTING CHIMNEY POT

46-17

EMERGENCY INQUIRY BUREAU

Repair of Air Raid Damage: Disagreement as to Cost.

SIR,—*We shall be grateful if you can assist us in the following matter:—*

Owing to enemy action during an air raid, damage was caused to a farmhouse and buildings owned by one of our clients. Our estimate of the cost of reinstatement was £1,600, *which figure was entered on the V.O.W.1 form and forwarded to the District Valuer. We also instructed a firm of architects and quantity surveyors to survey the damage and prepare a priced bill of quantities based upon present-day costs, this figure being* £1,500.

The District Valuer engaged a local architect as his assessor, whose estimate of the damage was £825, *based upon March,* 1939, *costs. Our architect disagreed with this figure. The assessor then paid a further visit to the site and amended his estimate to* £950, *which our architect would not agree to.*

We then instructed our architect and quantity surveyor to prepare a priced bill of quantities based on March, 1939, *costs, so that all figures should be on the same basis; this figure was* £1,150. *A copy of the quantities was forwarded to the District Valuer, who has now written the following:—*

"Your bill of quantities has been carefully checked through, and I see no reason to alter my offer of £950, *as I am advised that your prices are high for this class of work. If you cannot advise your client to accept the offer I made I must reopen the whole question and consider whether the cost of reinstatement exceeds the diminution of the market value of the property; if so, of course, the latter course will have to be applied."*

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A.R.P. SCHEMES

LONDON.

Caterham.—U.D.C. approved contract with B. R. Palmer and Co. for domestic surface-type shelters.

Erith. — T.C. approved shelter, Kent County Council junior instruction centre, Kent C.C.

Finsbury.—B.C. received sanction from London Civil Defence Region, approving £535 for waterproofing a shelter.

Harrow.—Subject to approval of London Region, Sur. to U.D.C. instructed to provide, at £200, concrete wash-down at West House, Pinner, for decontamination of vehicles.—Plans for cleansing facilities at Pinner, at £550, approved.

Heston and Isleworth.—Boro' Surveyor instructed to prepare scheme and estimate of cost of constructing overground domestic brick shelters in back gardens as an alternative to Anderson shelters.

Stoke Newington.—T.C. to purchase from Steel and Co., of Bethnal Green, E., 2,000 three-tier steel bunks for use in public shelters, at £2 0s. 6d. per tier of three bunks.

Walthamstow. — T.C. received from Regional Technical Adviser approval to tender of Sands and Lipscombe for domestic surface shelters, and to construction of additional air raid shelters for 1,490 persons at £4,293 18s.—Shelter at Electric House to be waterproofed by Sealocrete, Ltd., at £197 19s.—Council approved schemes for lighting and heating school shelters.—Council also to provide protected sleeping accommodation for personnel at auxiliary fire stations at £768.—Boro' Eng. and Sur. reported that approval been received from City Corporation for certain air raid shelters.

Wembley. — Boro' and Sur. prepared designs for dormitory shelter in a park.

West Ham.—B.C. approved: Shelters for 35 persons, Newman and Jacques, architects; shelters for 22 persons for Home and Colonial Stores, Ltd.

Wood Green.—B.C. placed contracts with C. Turner, Ltd., for supply and installation of 700 bunk units in communal shelters at £2 10s. per unit, and Mattock Bros., Ltd., for installation of 177 bunk units at 7s. 6d. per unit.

PROVINCIAL.

Accrington. — T.C. propose communal kitchens and feeding centres. Plans by H. Sanderson, Boro' Eng.

Adwick-le-Street.—U.D.C. placed contracts for trench shelters for 3,300 persons, at £6,270; surface shelters at £859 10s. and £3,000. Plans by W. S. Ellis, Sur.

Alnwick.—For shelters for R.D.C., contract placed with Green and Sons, Ltd., Warkworth.

Amble.—For communal shelters for U.D.C., contract placed with R. and G. Brown (Amble), Ltd., Amble.

Barrow-in-Furness. — T.C. propose deep shelters. Plans by F. L. Woodridge, Boro' Sur.

Bath.—T.C. to adapt premises as first-aid casualty station, at £351.—Shelter for 50 children to be provided at a school.—Contracts placed for shelter protection with F. J. Amery and Sons, G. Hewitt and Son, and J. W. Knight and Son.

Bath.—For electric lighting shelters T.C. accepted tender of H. L. Bush and Co., Ltd., at £171 16s.

Billingham-on-Tees. — U.D.C. received sanction to build 150 shelters, at £4,858.

Birkenhead.—T.C. propose tunnel shelters. Plans by B. Robinson, Boro' Sur.

Boldon.—U.D.C. approved scheme to extend A.R.P. depot. Plans by J. Hindmarch, Sur.

Bolton.—T.C. propose two communal feeding centres and kitchens. Plans by W. G. Codling, Boro' Eng.

Bootle.—T.C. propose deep bomb-proof shelters for 38,000 persons on five sites. Plans by W. A. Harrison, Boro' Sur.

Bootle.—T.C. to instal lighting, doors and bunks in 81 school shelters.

Border.—R.D.C. propose communal surface shelters on eight sites. Plans by G. Gray, Eng., 7, Victoria-pl., Carlisle.

Boston.—R.D.C. propose domestic and communal shelters on selected sites. Plans by W. R. Beardsall, Sur.

Bridgnorth. — T.C. accepted tender at £218 10s. submitted by D. Rowell, Ltd., 14, Howick-pl., London, S.W.1, for A.R.P. work.

Bromsgrove.—U.D.C. propose 59 additional surface shelters and 250 Anderson steel shelters. Plans by F. W. Goodman, Sur.

Burton Latimer.—U.D.C. to erect shelter for A.R.P. personnel at auxiliary fire station, and domestic communal shelters on selected sites.—Electric lights to be installed in public shelters. Plans by G. C. Borman, Sur.

Cannock.—U.D.C. propose electrical installations in school shelters.

Castle Ward.—R.D.C. secured approval to build 65 shelters, at £4,000. Plans by T. Jameson, Sur., Fernlea, Ponteland.

Cheadle.—R.D.C. to prepare scheme for communal shelters. Plans by J. W. Burton, Sur.

Cheshire.—C.C. propose 129 additional communal shelters, at £17,183. Plans by C. Greenwood, County Sur.

Chesterfield. — For communal surface shelters of various types, T.C. placed contracts with: L. W. Crossley, F. Hubbuck, H. Buckley and Co., H. Wholey, Revill and Beresford, J. Jones, A. Needham, F. Gartside; Greenwoods (Mansfield), Ltd., Mansfield; B. Hattersley; W. H. Frearson, Littlemoor; and W. Marsden. Plans by W. S. Wilson, Boro' Eng. Rest of contractors of Chesterfield.

Conisborough.—U.D.C. propose adaptation of Primitive Methodist Church Hall and Crowcroft Bakery for communal kitchens and feeding centres. Plans by H. Thirlwall, Sur.

Durham.—For shelters at two schools for E.C. contract placed with F. W. Goodyear and Son, Durham, at £1,140.—Schemes and plans for shelters at 56 schools forwarded to Board of Education for approval. Plans by F. Willey, 34, Old Elvet, Durham.—R. Gallacher and Son, Cemetery-rd., Blackhill, Co. Durham, contractors for shelters and protective works at an institution.

Edlington.—P.C. to proceed with deep tunnel shelter.

Essex.—C.C. recommend tender of Walter Strong, Ltd., at £2,330 19s., for replacing deteriorating sandbags at a county hospital; tender of A. Saunders, of Brentwood, at £430, for shelters for protection of patients and staff at a sanatorium; tenders of R. G. Garner, of Romford, at £789, for waterproofing roof walls and floors of shelter trenches at Romford; decontamination laundries at two hospitals, at £296; additional expenditure in connection with laundry for decontamination of protective and civilian clothing for Barking, Dagenham and Ilford areas, at £205; brickwork protection at hospital first-aid post at £210; protective works at A.R.P. headquarters, at £200; additional sleeping accommodation and shelters for personnel at two depots, at £355 13s. 2d.; replacement of sandbag protection by brickwork at district hospital first-aid post, at £185; brick surface shelter for protection of personnel at a depot, at £180; garage accommodation for A.R.P. vehicles, at two depots, at £865; brick surface shelter at four depots, at £720; depots at £1,580 and £1,670; improved accommodation at a depot, at £111 10s.; strengthening work at a centre, at £217 12s.; construction of new depots, at £5,872; replacement of protective walls with concrete blocks at first-aid posts and maternity home, at £2,291; replacement of sandbag protection with concrete blocks at two homes, at £735; erection and lighting of domestic shelters, at £453; additional expenditure in connection with shelters for patients and staff of hospital at £1,210 2s.; shelter at a boy's home, at £109 18s.; strengthening corridor and shelter at a hospital, £183 10s.

Eston. — U.D.C. to build 150 domestic shelters at £2,860, and waterproof other shelters by concreting at £3,325.

Hebburn.—U.D.C. accepted tender of B. Coulfield, Grant-st., Jarrow, for drainage and improvements to 400 domestic shelters.

Hemsworth.—R.D.C. to erect communal shelters at seven collieries. Plans by S. Price, Sur.

Kettering.—E.C. to erect shelters for 120 additional children.—Northamptonshire C.C. placed contract, at £677 13s. 6d., with C. Adams and Son, Finedon-rd., Wellingborough, for shelter at hospital.—Guardian's Committee propose shelters at P.A.C. institution.

Kidderminster.—E.C. placed contract for heating and lighting installation of shelter at school with Staffordshire, Worcestershire and Shropshire Electric Power Co., Ltd., Mucklows Hill, Halesowen.—E.C. propose strengthening six corridors at school for shelters, at £260.

Lancashire.—C.C. propose shelters at Gt. Harwood, Clayton-le-Moors, Church and Oswaldtwistle, Chatburn and Whalley. Plans by S. Wilkinson (F.), County Architect.

Lisburn.—For building of brick and concrete storage accommodation for repair and rescue and A.F.S. equipment, and building of two corrugated asbestos-sheeted sheds for storage, etc., also cleansing centre for decontamination, T.C. placed contracts as follows:—A.F.S. stores: Graham and Sons, Ltd., Hillsborough, Co. Down, £355; two sheds: Graham and Sons, Ltd., £102; and cleansing centre, J. McCall, Belfast, £492. Plans by R. E. L. Clarke, B.A., B.E., A.M.I.C.E., Town Sur. and Eng.

Liverpool T.C.—T.C. recommend application to M.H. to borrow £500 in respect of shelters for Liverpool Collegiate School.

Macclesfield.—R.D.C. to select sites for communal shelters at Hurdsfield, Rainow, etc. Plans by J. H. Walters, architect, 19, Moody-st., Congleton.

Mansfield.—T.C. propose communal feeding centres.

Mirfield.—U.D.C. to erect 200 additional Anderson steel shelters.

Newcastle-upon-Tyne.—J. and W. Lowry, Corporation-st., secured contract for basement shelter at Bryson's, Ltd.—City Council to build shelters at a sanatorium. Plans by R. G. Roberts, City Architect, 18, Cloth Market.

Newcastle-upon-Tyne.—T.C. to construct deep shelter by direct labour, at £35,000. Plans by Mr. Percy Parr, City Eng.

Newcastle-under-Lyme. — T.C. propose emergency feeding centres at council schools, and construction of deep shelters.—T.C. received sanction to borrow £1,169 10s. 6d. and £1,324 14s. 4d. for two first-aid posts. Plans by A. Cotton, Boro' Sur.

Newcastle-under-Lyme. — R.D.C. to erect additional shelters.

Norfolk. — Works for C.C. Plans by C. J. Norton, F.R.I.B.A., County Architect, 25, Thorpe-rd., Norwich. Small (25 persons) brick and concrete shelter at Acle, contractor, A. E. Daniels, Acle, at £114, and conversion of two basements into shelters at Harleston. Contractors, W. G. Youngs, Harleston, Norfolk, at £130, and A. Hood and Sons, Ditchingham, Norfolk, at £96 10s.

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Northamptonshire.—C.C. accepted tender of £371 14s. submitted by W. M. Freeman and Son, West-st., Oundle, for shelter at a hospital.

Northumberland.—Tenders accepted by County E.C. for school shelters. W. W. Tasker, County Architect, Morpeth: H. Wallace and Sons, Hexham, £264; B. Peel, Ltd., Tynemouth, £516; and R. and G. Brown, Ltd., Amble, £110.—C.C. to build two school shelters, at £250.

Norton.—R.D.C. to erect communal shelters.

Oldham.—T.C. to erect 120 additional Anderson steel shelters,—Electric lighting to be installed in 50-person-and-over public shelters.

Oswaldsthwistle.—Council to build shelters by direct labour.

Padiham.—U.D.C. propose 110 communal shelters for 5,280 persons.

Rochdale. — Emergency Committee to instal 3,000 bunks in public shelters.

Rotherham.—Health Committee to replace sandbags with brick protective walls at two hospitals and one sanatorium.

Rothwell.—U.D.C. prepared plans for 21 48-person surface shelters, cost £160 each.

Runcorn.—R.D.C. propose deep shelters at Frodsham, Halton and Helsby, and conversion of basements for additional shelters. Plans by A. J. King, Sur.

Rushden.—U.D.C. placed contract at £493 with R. C. Tarn, of Finedon, Irthlingborough, for three public shelters.

Salford.—T.C. propose central feeding communal kitchens and construction of underground shelters in lieu of surface shelters. Plans by W. A. Walker, Boro' Eng.

Salford.—E.C. accepted tender of Luke Tims and Sons, Pendleton, at £123 14s., for shelter at workshop.

South Bromsgrove.—W. Weaver, Ltd., The Strand, Bromsgrove, contractors for three shelters, each for 60 scholars at schools for Worcestershire E.C.

Sowerby Bridge—U.D.C. to erect domestic communal shelters at Luddendenfoot and at the Triangle.

Spenborough.—U.D.C. to erect a public shelter at Mirfield Moor.

Staveley.—U.D.C. propose communal feeding centres and kitchens.

Stockton-on-Tees.—For 13 shelters for R.D.C., contract placed with Crowe and Rourke, Stockton-on-Tees, at £1,443 15s.

Stourport.—E.C. to erect three shelters for 180 scholars at girls' school playground.

Tettenhall.—U.D.C. to erect domestic shelters.

Upholland. — U.D.C. to erect additional shelters for 60 per cent. of population.

Wednesbury.—T.C. applying to M.H. for sanction to borrow £1,725 for lighting and heating of school trenches.

Wellingborough.—U.D.C. to erect two 50-person public shelters and additional communal shelters.—48 bunks to be installed at Y.M.C.A. building and public library.—Northamptonshire C.C. to erect two brick surface shelters, at £330.—Contract placed with W. Thompson and Sons, Ltd., 38, Finedon-rd., Irthlingborough, for shelter at hospital.

Whitworth.—U.D.C. propose communal feeding centre and kitchen. Plans by G. V. Law, Sur.

Wirksworth. — U.D.C. to erect 50-person public communal shelters on six sites.

Wolverhampton.—T.C. approved: Decontamination centre and first-aid room to works.

Wombwell.—U.D.C. propose communal feeding centre.—U.D.C. to erect additional large-size Anderson steel shelters.

SCOTLAND.

Bishopbriggs.—John Stewart, F.R.I.B.A., Lanarkshire County Dept., Albert-st., Motherwell, architect for cleansing station and A.R.P. centre, at £2,000.

Glasgow.—Corporation accepted tender of £2,316 of Robert Sprint and Son, Ltd., Glasgow, for erection at hospital of A.R.P. shelters. Plans by T. Somers, architect, Office of Public Works.

Perth.—J. Penman, F.R.I.B.A., Municipal-chambs., architect for various shelters.

Shotts.—Plans prepared for new centre and cleansing station. The architect is W. Walls, Lanarkshire County Architect, Motherwell-Wishaw.

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. The dates at the head of paragraphs are those for the submission of tenders: a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING.

JANUARY 11.

Great Harwood U.D.C.—Communal domestic shelters. J. H. Sutcliffe, Acting Sur.

Newmarket U.D.C.—20 communal domestic shelters. F. B. Waterfall, Sur.

JANUARY 13.

Abertillery U.D.C.—Seven surface brick shelters at school. A Gordon Jones, Eng. and Sur. Dep. £1 1s.

Malmesbury T.C.—4 non-parlour type houses. Walter Rudman and Edwards, chartered and registered architects, 32, Market-pl., Chippenham. Dep. £2 2s.

Newcastle-upon-Tyne T.C.—Repairs to Picnic room, Deep Dene House, Jesmond Dene. City Eng.

Rushden U.D.C.—Strengthening of basements for use as shelters. J. W. Lloyd, Sur.

South Cork Board of Health.—Dispensary at Cloyne. R. O'Flynn, Eng., Boardroom, Douglas-rd., Cork. Dep. £2.

JANUARY 14.

Gravesend T.C.—Ground floor portion of new police headquarters and fire station. Borough Architect, 5, Woodville-ter. Dep. £3 3s.

West Riding C.C.—Two surface shelters at Middleton-in-Wharfedale sanatorium, near Ilkley. West Riding Architect, Wakefield.

Worcester T.C.—Air raid shelters. City Eng., 22, Bridge-st. Dep. £2 2s.

JANUARY 15.

Croydon C.B.—600 standard domestic surface shelters. Boro' Eng.

JANUARY 16.

Dublin Corporation.—332 houses with estate office annexe on Cabea West housing estate. H. G. Simms, Housing Architect, 5, Wellington Quay. Dep. £5 5s.

JANUARY 17.

Bath T.C.—Domestic surface communal shelters and blast walls. J. Owens, Deputy City Eng. Dep. £2 2s.

JANUARY 20.

Poole T.C.—Alterations and additions to Alderney isolation hospital, Ringwood-rd., Parkstone. J. R. Barron, Boro' Eng. Dep. £2 2s.

JANUARY 25.

Millom R.D.C.—Filtering station, etc., for waterworks scheme. Taylor and Wallin, engineers, 1, Saville-pl., Newcastle-upon-Tyne, 1.

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NO DATE.

Cowes U.D.C.—Garage at depot, Victoria-rd. J. H. Veale, Eng. and Sur.

Loughborough T.C.—Communal and public shelters. W. Granger, Boro' Sur.

PAINTING, ELECTRIC LIGHTING, HEATING, &c.

JANUARY 15.

York T.C.—Terrazzo flooring and cork flooring at new hospital, Huntington-rd. Chas. J. Minter, City Eng.

JANUARY 18.

Oldham C.B.—Repairs to 4 retort chimneys. F. Greenhalgh, Gas and Water Offices, Greaves-st.

JANUARY 20.

Leeds T.C.—Repairs on housing estates from Groups 1-7. R. A. H. Livett (A.), Housing Director, 25, Great George-st. Charge 5s.

MATERIALS.

JANUARY 13.

Chorley R.D.C.—Road materials. W. Cotterill, Highway Sur.

Ilkeston T.C.—Highway materials. A. O. Marshall, Boro' Sur. and Water Eng.

JANUARY 14.

Finsbury B.C.—Road materials. Boro' Eng.

JANUARY 18.

Bexley T.C.—Highway materials. Boro' Eng. and Sur.

West Riding C.C.—Road materials, etc., for a number of districts. West Riding Sur., Wakefield.

JANUARY 25.

Stockport C.B.—Builders materials for Gas Dept. Sec., Gas Dept.

JANUARY 30.

Lambeth B.C.—Road materials. G. H. Buckett, Town Hall.

FEBRUARY 1.

Rhondda U.D.C.—Road materials. E. Taylor, Eng. and Sur.

FEBRUARY 17.

Selby R.D.C.—Road materials. F. Braithwaite, Sur., 22, Park-st.

ENGINEERING, IRON AND STEEL.

JANUARY 7.

Enniskillen R.D.C.—Work in connection with installation of new water supply at Lisbellaw. J. Brown, Clerk, Workhouse. Dep. £5.

JANUARY 15.

Dublin T.C.—Reinforced concrete reservoir. City Eng., 28, Castle-st. Dep. £10 10s.

ROAD, SEWERAGE AND WATER WORKS.

JANUARY 10.

Clogher R.D.C.—Laying of 3¼ miles of 4-in. Everite water main, including valves, etc. J. P. Rush, Eng., Courthouse, Lisburn.

Southport T.C.—Tarmacadam paths and surface water drainage at Duke-st. cemetery. Boro' Sur. Dep. £1 1s.

JANUARY 13.

Doncaster C.B.—Extension to Beckett-rd. and Worcester-av. Boro' Eng., 2, Priory-pl. Dep. £2 2s.

JANUARY 15.

Liverpool T.C.—Back-st. sewers, pavings, etc., to flats, Blucher-st. City Architect and Director of Housing, Blackburn-chambs., Dale-st. Dep. £1 1s.

JANUARY 17.

Luton T.C.—Main outfall sewer, consisting of approx. 3,000 ft. of 5-ft. dia. sewer, 2,000 ft. of which is in tunnel. F. Oliver, Boro' Eng. and Sur. Dep. £2 2s.

Norton R.D.C.—Laying and construction of 2,160 yds. cast-iron watermains and works incidental thereto in parishes of Settrington and Scampston. D. H. Moore, Consulting Eng., 10, York-pl., Scarborough. Dep. £2 2s.

Public Appointments.

JANUARY 25.

***Edmonton T.C.**—Temporary Quantity Surveying Assistant. F. W. Claxton, T.C.

RATES OF WAGES IN THE BUILDING TRADE

AS AND FROM 1st DECEMBER, 1940

[Every endeavour is made to ensure accuracy, but we cannot be responsible for errors]

	Crafts-men.	Lab-ourers.
Aberavon	1/9½	1/4½
Aberdare	1/9½	1/4½
Abergavenny	1/9½	1/4½
Abingdon	1/8	1/3½
Accrington	1/9½	1/4½
Aldeburgh	1/6	1/2
Aldershot	1/8	1/3½
Alfreton	1/9½	1/4½
Alnwick	1/9	1/4½
Altrincham	1/9½	1/4½
Amble	1/9	1/4½
Amersham	1/8	1/3½
Ammanford	1/9½	1/4½
Andover	1/7½	1/3½
Ardingley	1/7½	1/3½
Arundel	1/7½	1/3½
Ascot	1/7½	1/3½
Ashby-de-la-Zouch	1/9½	1/4½
Ashford (Kent)	1/7½	1/3½
Ashford (Middlesex)	1/9½	1/4½
Ashington	1/9	1/4½
Ashtead	1/9½	1/4½
Ashton-under-Lyme	1/9½	1/4½
Aylesbury	1/7½	1/3½
Aylsham	1/6½	1/2½
Bagshot	1/7½	1/3½
Banbury	1/7½	1/3½
Barnsley	1/9½	1/4½
Barnstaple	1/7½	1/3½
Barrow-in-Furness	1/9½	1/4½
Barry	1/9½	1/4½
Basingstoke	1/7½	1/3½
Bath	1/9	1/4½
Batley	1/9½	1/4½
Beaconsfield	1/8	1/3½
Beccles	1/6	1/2
Bedford	1/9	1/4½
Berkhamsted	1/7½	1/3½
Berwick	1/9	1/4½
Beverley	1/9½	1/4½
Bexhill-on-Sea	1/8	1/3½
Rideford	1/7½	1/3½
Biggleswade	1/7½	1/3½
Billericay	1/7	1/2½
Birchington	1/7½	1/3½
Birkenhead	‡§1/11	¶
Birmingham	†1/9½	†1/4½
Bishop Auckland	1/9½	1/4½
Bishops Stortford	1/8½	1/4
Blackburn	1/9½	1/4½
Blackpool	1/9½	1/4½
Blyth	1/9½	1/4½
Bognor Regis	1/7½	1/3½
Bolton	1/9½	1/4½
Bournemouth	1/8½	1/4
Bracknell	1/7½	1/3½
Bradford	1/9½	1/4½
Bradford-on-Avon	1/6½	1/2½
Braintree	1/7½	1/3½
Brentwood	1/9	1/4½
Bridgwater	1/8	1/3½
Bridlington	1/9	1/4½
Brighouse	1/9½	1/4½
Brighton	1/8½	1/4
Bristol	1/9½	1/4½
Broadstairs	1/7½	1/3½
Bromsgrove	1/9	1/4½
Buckley	1/9½	1/4½
Bungay	1/5½	1/1½
Burnham-on-Crouch	1/6	1/2
Burnley	1/9½	1/4½
Burslem	1/9½	1/4½
Burton-on-Trent	1/9½	1/4½
Bury	1/9½	1/4½
Bury St. Edmunds	1/7	1/2½
Buxton	1/9	1/4½
Byfleet	1/8	1/3½
Cambridge	1/9½	1/4½
Canterbury	1/7½	1/3½
Cardiff	1/9½	1/4½
Carlisle	1/9½	1/4½
Carnforth	1/9½	1/4½
Castleford	1/9½	1/4½
Caterham	1/9½	1/4½
Chard	1/6½	1/2½
Chatham	1/8½	1/4
Chelmsford	1/9	1/4½
Cheltenham	1/8½	1/4
Chepstow	1/9	1/4½
Chertsey	1/8½	1/4
Chester	1/9½	1/4½
Chesterfield	1/9½	1/4½
Chichester	1/7½	1/3½
Chorley	1/9½	1/4½
Cirencester	1/7	1/2½
Clacton	1/7½	1/3½
Cleveleys	1/9½	1/4½
Clitheroe	1/9½	1/4½
Cobham (Surrey)	1/8½	1/4
Colchester	1/9	1/4½
Colwyn Bay	1/8½	1/4
Congleton	1/9	1/4½
Coventry	1/9½	1/4½
Cranbrook	1/7½	1/3½
Cranleigh	1/7½	1/3½
Crawley	1/7½	1/3½
Crewe	1/9	1/4½
Cromer	1/6½	1/2½
Crowborough	1/7½	1/3½
Cuckfield	1/7½	1/3½
Darlington	1/9½	1/4½
Darwen	1/9½	1/4½
Daventry	1/8	1/3½
Deal	1/7½	1/3½
Denbigh	1/8½	1/4
Derby	1/9½	1/4½
Devizes	1/6½	1/2½
Dewsbury	1/9½	1/4½
Didcot	1/7½	1/3½
Diss	1/6	1/2
Doncaster	1/9½	1/4½
Dorchester	1/7	1/2½
Dorking	1/8	1/3½
Dover	1/7½	1/3½
Dovercourt	1/7½	1/3½
Driffield	1/8	1/3½
Droitwich	1/9	1/4½
Dudley	1/9½	1/4½
Dunstable	1/8	1/3½
Durham City	1/9½	1/4½
Eastbourne	1/8½	1/4
E. Glam. (Mon. Val.)	1/9½	1/4½
East Grinstead	1/7½	1/3½
Edenbridge	1/7½	1/3½
Ely	1/6½	1/2½
Epping	1/9½	1/4½
Exeter	1/9	1/4½
Exmouth	1/8	1/3½
Fakenham	1/6½	1/2½
Falmouth	1/8	1/3½
Fareham	1/8½	1/4
Faversham	1/7½	1/3½
Felixstowe	1/8½	1/4
Filey	1/8	1/3½
Fleetwood	1/9½	1/4½
Flint	1/9½	1/4½
Folkestone	1/7½	1/3½
Frinton-on-Sea	1/7½	1/3½
Frome	1/6½	1/2½
Gainsborough	1/8½	1/4
Gateshead	1/9½	1/4½
Gillingham (Kent)	1/8½	1/4
Glossop	1/9½	1/4½
Gloucester	1/9	1/4½
Godalming	1/7½	1/3½
Goole	1/9½	1/4½
Gosport	1/9	1/4½
Grantham	1/8½	1/4
Gravesend	1/9	1/4½
Great Yarmouth	1/7½	1/3½
Grimsby	1/9½	1/4½
Guildford	1/7½	1/3½
Guisborough	1/8	1/3½
Halifax	1/9½	1/4½
Hanley	1/9½	1/4½
Harpenden	1/8½	1/4
Harrogate	1/9½	1/4½
Hartlepools	1/9½	1/4½
Harwich	1/7½	1/3½
Haslemere	1/7½	1/3½
Hastings	1/7½	1/3½
Hatfield	1/9	1/4½
Haywards Heath	1/7½	1/3½
Hednesford	1/9	1/4½
Hemel Hempstead	1/8½	1/4
Henley-on-Thames	1/7½	1/3½
Hereford	1/7½	1/3½
Herne Bay	1/7½	1/3½
Hertford	1/9	1/4½
Heysham	1/9½	1/4½
Hitchin	1/8½	1/4
Hoddesdon	1/9	1/4½
Holt (Norfolk)	1/6	1/2
Horley	1/7½	1/3½
Horsham	1/7½	1/3½
Horwich	1/9½	1/4½
Huddersfield	1/9½	1/4½
Hull	1/9½	1/4½
Hunstanton	1/6½	1/2½
Huntingdon	1/7	1/2½
Ilfracombe	1/7½	1/3½
Ingatestone	1/8	1/3½
Ipswich	1/9	1/4½
Isle of Thanet	1/7½	1/3½
Isle of Wight	1/7	1/2½
Keighley	1/9½	1/4½
Kenilworth	1/9½	1/4½
Kettering	1/9½	1/4½
Kidderminster	1/9	1/4½
King's Lynn	1/7½	1/3½
Kirkham	1/9½	1/4½
Knowle	1/9	1/4½
Lancaster	1/9½	1/4½
Leamington	1/9½	1/4½
Leatherhead	1/8½	1/4
Leeds	1/9½	1/4½
Leicester	1/9½	1/4½
Leighton Buzzard	1/6½	1/2½
Letchworth	1/8½	1/4
Lewes	1/7½	1/3½
Lichfield	1/8½	1/4
Lincoln	1/9½	1/4½
Littlehampton	1/7½	1/3½
Liverpool	†§1/11	¶
Llandudno	1/8½	1/4
Llanelly	1/9½	1/4½
London—		
12m. radius	•1/11	1/5½
12-15 m. radius	•1/10½	1/5½
Long Eaton	1/9½	1/4½
Longton	1/9½	1/4½
Loughborough	1/9½	1/4½
Louth	1/8	1/3½
Lowestoft	1/7½	1/3½
Luton	1/9	1/4½
Macclesfield	1/9	1/4½
Maidenhead	1/8½	1/4
Maidstone	1/8	1/3½
Malvern	1/8	1/3½
Manchester	1/9½	1/4½
Manningtree	1/6½	1/2½
Mansfield	1/9½	1/4½
March	1/6½	1/2½
Margate	1/7½	1/3½
Market Harborough	1/8½	1/4
Matlock	1/8	1/3½
Melton Constable	1/6	1/2
Melton Mowbray	1/8½	1/4
Merthyr	1/9½	1/4½
Middlesbrough	1/9½	1/4½
Middleton	1/9½	1/4½
Middlewich	1/9	1/4½
Milford Haven	1/8	1/3½
Morecambe	1/9½	1/4½
Morley	1/9½	1/4½
Mundesley	1/6½	1/2½
Nantwich	1/9	1/4½
Nelson	1/9½	1/4½
Newark-on-Trent	1/9	1/4½
Newbury	1/7½	1/3½
Newcastle-on-Tyne	1/9½	1/4½
Newcastle-u.-Lyme	1/9½	1/4½
New Forest	1/7½	1/3½
Newmarket	1/7½	1/3½
Newport, Mon.	1/9½	1/4½
Newport Pagnell	1/7½	1/3½
Northampton	1/9½	1/4½
Norwich	1/9½	1/4½
Nottingham	1/9½	1/4½
Nuneaton	1/9½	1/4½
Oakham	1/8	1/3½
Oldham	1/9½	1/4½
Ormskirk	1/9½	1/4½
Oxford	1/9	1/4½
Oxted	1/8	1/3½
Paignton	1/9	1/4½
Peterborough	1/9	1/4½
Plymouth	1/9½	1/4½
Pontefract	1/9½	1/4½
Pontypridd	1/9½	1/4½
Port Talbot	1/9½	1/4½
Portsmouth	1/9	1/4½
Preston	1/9½	1/4½
Pulborough	1/7½	1/3½
Ramsgate	1/7½	1/3½
Reading	1/9	1/4½
Redditch	1/9	1/4½
Redhill	1/8	1/3½
Ripon	1/8	1/3½
Rochdale	1/9½	1/4½
Rochester	1/8½	1/4
Rugby	1/9½	1/4½
St. Albans	1/9	1/4½
St. Helens	1/9½	1/4½
St. Neots	1/7	1/2½
Saffron Walden	1/6½	1/2½
Salisbury City	1/7	1/2½
Salisbury Plain	1/8½	1/4
Sawbridgeworth	1/8	1/3½
Saxmundham	1/6	1/2
Scarborough	1/9	1/4½
Scunthorpe	1/9½	1/4½
Selby	1/9½	1/4½
Sevenoaks	1/8	1/3½
Sheerness	1/7½	1/3½
Sheffield	1/9½	1/4½
Shipley	1/9½	1/4½
Shoeburyness	1/9	1/4½
Shoreham	1/8½	1/4
Shrewsbury	1/9	1/4½
Sittingbourne	1/7½	1/3½
Skegness	1/8½	1/4
Sleaford	1/8	1/3½
Slough	1/8½	1/4
Southampton	1/9	1/4½
Southend-on-Sea	1/9	1/4½
Southport	1/9½	1/4½
South Shields	1/9½	1/4½
Spalding	1/7½	1/3½
Stafford	1/9	1/4½
Staines	1/8½	1/4
Stamford	1/8½	1/4
Stevenage	1/8½	1/4
Stockport	1/9½	1/4½
Stockton-on-Tees	1/9½	1/4½
Stoke-on-Trent	1/9½	1/4½
Stourbridge	1/9½	1/4½
Stourport	1/9	1/4½
Stowmarket	1/6½	1/2½
Stratford-on-Avon	1/8½	1/4
Stroud	1/8½	1/4
Sunderland	1/9½	1/4½
Sutton Coldfield	1/9½	1/4½
Swaffham	1/6	1/2
Swanage	1/7½	1/3½
Swansea	1/9½	1/4½
Swindon	1/8	1/3½
Tamworth	1/9	1/4½
Taunton	1/8	1/3½
Tenterden	1/7½	1/3½
Thames Haven	1/9½	1/4½
Thetford	1/7	1/2½
Thorpe Bay	1/9	1/4½
Todmorden	1/9½	1/4½
Tonbridge	1/8	1/3½
Torquay	1/9	1/4½
Totnes	1/7½	1/3½
Trowbridge	1/6½	1/2½
Truro	1/7	1/2½
Tunbridge Wells	1/8	1/3½
Uppingham	1/8	1/3½
Uttoxeter	1/8	1/3½
Wakefield	1/9½	1/4½
Walsall	1/9½	1/4½
Walsden	1/9½	1/4½
Walton-on-Naze	1/7½	1/3½
Ware	1/9	1/4½
Warminster	1/6½	1/2½
Warrington	1/9½	1/4½
Warwick	1/9½	1/4½
Wellingborough	1/9	1/4½
Welwyn	1/8½	1/4
Welwyn Gar. City	1/9½	1/4½
Wells (Norfolk)	1/6	1/2
West Bromwich	1/9½	1/4½
Westcliff-on-Sea	1/9	1/4½
Weston-super-Mare	1/8½	1/4
Weybridge	1/8½	1/4
Weymouth	1/7½	1/3½
Whitby	1/8½	1/4
Whitstable	1/7½	1/3½
Widnes	1/9½	1/4½
Wigan	1/9½	1/4½
Wigton	1/8	1/3½
Willington	1/9½	1/4½
Wilmslow	1/9½	1/4½
Winchester	1/8	1/3½
Windermere	1/8	1/3½
Windsor	1/8½	1/4
Wisbech	1/7	1/2½
Witham	1/7½	1/3½
Woking	1/8	1/3½
Wokingham	1/7½	1/3½
Wolverhampton	1/9½	1/4½
Woodbridge	1/7	1/2½
Worcester	1/9	1/4½
Workington	1/8	1/3½
Worksop	1/9	1/4½
Worthing	1/7½	1/3½
Wrexham	1/9	1/4½
Wroxham	1/7	1/2½
Wycombe	1/8½	1/4
Wymondham	1/6½	1/2½
Yeovil	1/8	1/3½
York	1/9½	1/4½

• Painters 1d. less than other Craftsmen. † Plus 2d. per working day. ‡ Plasterers 1/11½

¶ Tradesman's Labourers, 1/5½. Navvies and General Labourers 1/4½.

§ Joiners, Plumbers, Bricklayers, Tilers and Masons receive 2/- per week or 4d. per day Tool Money.

For Building Trade Wages in Scotland, see page 72.

PRICES CURRENT OF MATERIALS*

Note: Owing to the exceptional circumstances which prevail at the present time prices of materials should be confirmed by inquiry. The prices for soft woods are for cash on delivery, and are subject to adjustment when the increased price of £22 per standard for national released stocks is finally fixed.

At present linseed oil and genuine spirits of turpentine can only be supplied in cans in small quantities.

BRICKS, &c.

Delivered to site, City and Central Area, Full Lorry Loads. £ s. d.
Best Stocks 5 3 0
Second Hard Stocks 4 16 0

Per 1,000. Delivered at London Goods Stations.

2½ in. Phorpres. A discount of 6d. 1,000 only monthly account.	King's Cross Station per 1,000. s. d.	To sites in W.C. District. per 1,000. s. d.
Pressed	51 9	58 3
Keyed	53 9	60 3
Single Bullnose	71 9	78 3
Rustics	71 9	78 3
Whites	72 3	78 3

White Midhurst Facing Bricks (delivered London site) ..... £ 3 s. 12 d. 6
Best blue Pressed Staffs. (London Stns.). ... 10 2 0
Do. Bullnose (London Stns.) 10 12 0
Blue Wire Cuts (London Stns.). 8 19 6

Best Stourbridge Fire Brick (London Stns.):—
2½ in. ..... 9 3 6 3 in. 11 1 0

GLAZED BRICKS. (London Stns.)

Best White Ivory and Salt Glazed Stretcher.	28 0 0	D'ble Str'tch'rs .. D'ble Headers .. One side & two ends	36 10 0 33 10 0 37 10 0
Headers	27 10 0	Two sides & one end	38 10 0
Quoins, Bullnose and 4½in. Flats	34 10 0	Splays and Squints	36 0 0

Second Quality, £2 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours. Hard Glaze, £5 10s. extra over white.

PARTITION SLABS.

Delivered London Area.

"PHORPRES" HOLLOW PARTITION BLOCKS.

2" per yd. sup.	2 3	3" per yd. sup.	2 9
2½" " "	2 6	4" " "	3 1

CLINKER CONCRETE.

2" per yd. sup.	1 6	3" per yd. sup.	2 0
2½ " "	1 8	4" " "	2 4

CRANHAM TERRA COTTA.

2" per yd. sup.	3 0	3" per yd. sup.	3 8
2½ " "	3 6	4" " "	4 7

HEMPSTEAD—KEYED TWO SIDES.

12" x 9" x 2"	2 6	12" x 9" x 3"	3 0
12" x 9" x 2½"	2 9	12" x 9" x 4"	3 9

Per yard super d/d. Free on site, London.

SAND.

Thames Ballast.	8	6 per yd.	delivered 2 miles radius Paddington.
Pit Ballast	8	6 " "	
Pit Sand.	10	0 " "	
Washed Sand	13	0 " "	
¼ in. Shingle	8	0 " "	
¾in. Broken Brick	12	6 " "	
Pan Breeze	6	3 " "	

CEMENT.

Best British Portland Cement. Standard Specification delivered London Area. £ s. d.
4 ton loads and upwards site ..... Per ton 2 0 6
1 ton to 4 tons site 2 12 6
Alongside Vauxhall in 80 ton lots 2 7 0
"Ferrocrete" Rapid Hardening Cement—
4 ton loads and upwards site 2 15 6
1 ton to 4 tons site 2 18 6
Alongside Vauxhall in 80 ton lots 2 13 0
Stored in Reserved Bins at works. 1/6 per ton extra.
"Aquacrete" Water Repellent, "Blue Circle" cement, 30/- per ton extra or ordinary "Blue Circle" prices.
"Colorcrete" Nos. 1 and 2. Coloured Rapid Hardening Portland Cement 3 19 6
"Colorcrete" not rapid hardening, according to colour, from £7 to £15 10s. per ton.
"Snowcrete" White Portland Cement. 9 5 0
Super Cement (Waterproof), *bags extra*. 3 19 6
NOTE.—Paper bags will be charged at the rate of 6/- nett per ton. Jute sacks charged 1s. 9d. nett each and 1/6 nett each allowed if returned to works within two weeks, in good condition.
Carriage will be paid by makers on returned empty jute sacks.
Roman Cement £7 5 Keene's Cement, White £6 10 0
Parian Cement 6 10 " " Pink 6 5 0
Cementone Colours for cement according to tints per cwt. from £2 16s. 0d.

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	3 12 6	Sirapite, Coarse	4 3 0
" White	4 0 0	" Finish	4 11 0
Pioneer	4 3 0		

Above prices for 4-ton loads and over London Area.

Best Ground Blue Lias Lime	2 17 6	Grey Stone Lime Chalk Lime	2 12 6 2 12 6
Granite Chippings	1 10 0	Hair per cwt.	2 7 6

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d., if returned in good condition within three months, carriage paid.
Stourbridge Fireclay in sacks 37s. per ton at rly. dep.

STONE.

BATH STONE.—Delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube ..... s. d. 2 11½

PER STONE—RANDOM BLOCK—
Free on rail at Seaton Station. .per ft. cube 2 3
Delivered free on rail Nine Elms, S.R. " 3 1½
Selected approximate size one way, 1d. per cubic ft. extra, selected approximately three sizes or for special work, 3d. per cubic ft. extra.

PORTLAND STONE—
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube ..... s. 4 d. 6
Do. do. delivered on road waggons as above stations, per ft. cube 4 6
White basebed 3d. per ft. cube extra.
NOTE.—1d. per ft. cube extra for every ft. over 20 ft. *average* and ½d. beyond 30 ft.
HOPTON-WOOD STONE—
F.O.B. Quarries, Wirksworth, Derbyshire, Random blocks from 10 ft. and over F.ft.cb. 14 0
Sawn two sides 22 6
HOPTON-WOOD STONE—
Sawn three or four sides 27 9
YORK STONE, BLUE—*Robin Hood Quality.*
Delivered at any Goods Station, London.
6 in. sawn two sides landings to sizes (under 40 ft. super) ..... per ft.super 5 6
6 in. rubbed two sides, ditto .... " 6 3
8 in. sawn two sides slabs (random sizes) ..... " 2 7
2 in. to 2½ in. sawn one side slabs (random sizes) (paving) ..... " 1 8½
1½ in. to 2 in., ditto ..... " 1 4½
HARD YORK—
Delivered at any Goods Station, London.
Scrappied random blocks. ..... per ft. cube 6 10
6 in. sawn two sides landings to sizes (under 40 ft. super) ..... per ft.super 5 7½
6 in. rubbed two sides, ditto .... " 6 9
4 in. sawn two sides slabs (random sizes) ..... " 3 5
3 in. ditto ditto ..... " 2 8
2 in. self-faced random flags ..... Per yd. super 8 9

CAST STONE.

Delivered in London are in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Sills, 10s. 0d.

HARD WOOD.

1 INCH AND UP THICK.

	£ s. d.
Average price for prime quality.	
Dry Austrian Wainscot, per ft. cube	0 17 0
Dry American and/or Japanese Figured Oak, per ft. cube ..... .10 6 to	0 13 0
Dry American and/or Japanese plain Oak, per ft. cube	0 11 6
Dry sq. edged Honduras Mahogany, per ft. cube.	0 15 0
Dry log-cut Honduras Mahogany, per ft. cube. ..... 12 6 to	0 16 0
Dry Cuba Mahogany, per ft. cube	0 18 0
Dry Teak, per ft. cube	0 14 0
Dry American Whitewood, per ft. cube	0 10 6
Dry Australian Walnut, per ft. cube	0 19 0
Dry Queensland Silky Oak, per ft. cube	0 12 6
Dry African Mahogany, per ft. cube	0 10 0
Dry African Whitewood, per ft. cube	0 8 0
Dry English Wainscot Oak, per ft. cube	0 16 0
Best Scotch Glue, per cwt.	3 0 0
Liquid Glue, per cwt. .....4 7 0 to	5 10 0

SOFT WOOD.

MERCHANTABLE BRITISH COLUMBIAN PINE.

	Minimum. £ s. d.	Maximum. £ s. d.
Scantlings in imported sizes, 2in. by 3in. to 4in. by 11in.	43 10 0	53 0 0

Having secured the Contract— What about the Steel Scaffolding!

TUBULAR

—S & C—

SCAFFOLDING

For the lowest Prices apply to the Oldest Firm in The Scaffolding Trade.

STEPHENS & CARTER LTD.

The British Steel Scaffolding Co.

731-761, HARROW RD., N.W.10.

Telephone No. Ladbroke 1191 (6 lines).

PLANED BOARDS.

PRIME CLEAR BRITISH COLUMBIAN PINE.

	Per standard. £ s. d.
1in. by 11in. } 1in. by 9in. }	67 10 0

	Per square. s. d.
1in. plain edge flooring	53 0
1¼in. ditto	66 6
1in. tongued and grooved	53 0
1¼in. ditto	66 6

MATCHING.

	Per square. s. d.
⅝in.	37 6
¾in.	42 0
1in.	55 0

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	34 17 6	18 by 10	19 5 0
22 by 12	29 0 0	18 by 9	17 15 0
22 by 11	26 15 0	16 by 10	16 17 6
20 by 12	26 2 6	16 by 8	13 10 0
20 by 10	24 0 0		

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. ..... Per 1,000 f.o.r. London

		£ s. d.
Best machine-made tiles from Broseley or Staffordshire district.		£5 10 0
Ditto hand-made ditto		6 10 0
Ornamental ditto		6 15 0
Hip and valley tiles (per dozen)	Hand-made	0 11 6
	Machine-made.	0 11 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

	£ s. d.
R.S. Joists, cut and fitted	£22 10 0
Plain Compound Girders.	25 0 0
Stanchions	27 10 0
In Roof Work	32 10 0

NOTE.—These prices are for standard pieces and no special pieces of an awkward nature.

MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£ s. d.	Diameter.	£ s. d.
¼ in.	22 5 0	⅝ in. to ½ in.	20 15 0
⅛ in.	21 5 0	⅝ in. to 2¾ in.	20 5 0

WROUGHT TUBES AND FITTINGS.
Deliveries from works.
Deliveries from London stock further 2½% gross.

	Tubes. ½"/6' %	Tubulars. ¾"/6' %	Fittings. 10/17 and 19/24 %	Flanges. ½"/6" %	Flanges. 2½"/6' %
Light weight	55½	—	45	51½	42
Heavy weight	48	48½	40½	41	50½
Galv.lightweight	44	—	39	40	49
Galv.heavyweight	35½	35½	31	30	41

Tubes and tubulars sizes ½"/1" inclusive, charged extra of 5% less gross.
Fittings. Figs. 25/34 5% less gross discount.
Terms.—Nett cash end of month following date of invoice. Carriage paid on lots of £10 nett value and over.

C.I. HALF-ROUND GUTTERS—London Prices ex Works. per yd. in 6 ft. lengths.

	Gutters.	Nozzles.	Stop ends.
3 in.	1/4½	1/1	4d.
3½ in.	1/5½	1/2½	4d.
4 in.	1/5½	1/4½	6½d.
4½ in.	1/6½	1/8	7½d.
5 in.	1/10½	1/11½	8d.

O.G. GUTTERS.

3 in.	1/0	1/5½	4½d.
3½ in.	1/11½	1/5½	6d.
4 in.	1/11½	1/6½	7d.
4½ in.	2/0½	1/9½	8d.
5 in.	2/6	2/0½	9½d.

RAIN WATER PIPES.

Per yd. in 6 fts.	Pipe.	Bends.	Branches. Stock angles.
2 in.	2/0½	1/4½	2/0
2½ in.	2/1½	1/6½	2/4½
3 in.	2/7½	1/11½	2/10½
3½ in.	3/1	2/3½	3/4½
4 in.	3/6½	2/9½	4/0½

NETT PRICES.
Tonnage allowance—4-ton lots, 5 per cent. 2-ton lots, 2½ per cent.

L.C.C. COATED SOIL PIPES.—London Prices, ex Stock.

Per yd. in 6 fts.	Pipe.	Bends.	Branches.
2 in.	3/4½	2/4½	2/10½
2½ in.	4/0½	2/7½	3/7½
3 in.	4/4½	2/10½	4/3½
3½ in.	4/8½	3/7½	5/0½
4 in.	4/10	4/0½	5/9½

L.C.C. COATED DRAIN PIPE.

	Pipe.	Bends.	Branches.
3 in. per yd. in 9 fts.	5/5	6/3	9 11
cwt. qr. lbs.			
4 in. 1 1 20.	7/11	7/1	12/6
5 in. 1 2 22.	9/7	12/9	19/3
6 in. 2 0 6	11/5	14/8	25/6

Gaskin 65/- per cwt.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information. Prices are subject to 2½ per cent. cash discount.

RATES OF WAGES IN THE BUILDING TRADE

AS AND FROM 1st DECEMBER, 1940

[Every endeavour is made to ensure accuracy, but we cannot be responsible for errors]

	Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.
Aberavon	1/9½	1/4½	Clitheroe	1/9½	1/4½	Isle of Thanet	1/7½	1/3½	Saxmundham	1/6	1/2
Aberdare	1/9½	1/4½	Cobham (Surrey)	1/8½	1/4	Isle of Wight	1/7	1/2½	Scarborough	1/9	1/4½
Abergavenny	1/9½	1/4½	Colchester	1/9	1/4½	Keighley	1/9½	1/4½	Scunthorpe	1/9½	1/4½
Abingdon	1/8	1/3½	Colwyn Bay	1/8½	1/4	Kenilworth	1/9½	1/4½	Selby	1/9½	1/4½
Accrington	1/9½	1/4½	Congleton	1/9	1/4½	Kettering	1/9½	1/4½	Sevenoaks	1/8	1/3½
Aldeburgh	1/6	1/2	Coventry	1/9½	1/4½	Kidderminster	1/9	1/4½	Sheerness	1/7½	1/3½
Aldershot	1/8	1/3½	Cranbrook	1/7½	1/3½	King's Lynn	1/7½	1/3½	Sheffield	1/9½	1/4½
Alfreton	1/9½	1/4½	Cranleigh	1/7½	1/3½	Kirkham	1/9½	1/4½	Shipley	1/9½	1/4½
Alnwick	1/9	1/4½	Crawley	1/7½	1/3½	Knowle	1/9	1/4½	Shoeburyness	1/9	1/4½
Altrincham	1/9½	1/4½	Crewe	1/9	1/4½	Lancaster	1/9½	1/4½	Shoreham	1/8½	1/4
Amble	1/9	1/4½	Cromer	1/6½	1/2½	Leamington	1/9½	1/4½	Shrewsbury	1/9	1/4½
Amersham	1/8	1/3½	Crowborough	1/7½	1/3½	Leatherhead	1/8½	1/4	Sittingbourne	1/7½	1/3½
Ammanford	1/9½	1/4½	Cuckfield	1/7½	1/3½	Leeds	1/9½	1/4½	Skegness	1/8½	1/4
Andover	1/7½	1/3½	Darlington	1/9½	1/4½	Leicester	1/9½	1/4½	Sleaford	1/8	1/3½
Ardingley	1/7½	1/3½	Darwen	1/9½	1/4½	Leighton Buzzard	1/6½	1/2½	Slough	1/8½	1/4
Arundel	1/7½	1/3½	Daventry	1/8	1/3½	Letchworth	1/8½	1/4	Southampton	1/9	1/4½
Ascot	1/7½	1/3½	Deal	1/7½	1/3½	Lewes	1/7½	1/3½	Southend-on-Sea	1/9	1/4½
Ashby-de-la-Zouch	1/9½	1/4½	Denbigh	1/8½	1/4	Lichfield	1/8½	1/4	Southport	1/9½	1/4½
Ashford (Kent)	1/7½	1/3½	Derby	1/9½	1/4½	Lincoln	1/9½	1/4½	South Shields	1/9½	1/4½
Ashford (Middlesex)	1/9½	1/4½	Devizes	1/6½	1/2½	Littlehampton	1/7½	1/3½	Spalding	1/7½	1/3½
Ashington	1/9	1/4½	Dewsbury	1/9½	1/4½	Liverpool	†§1/11	¶	Stafford	1/9	1/4½
Ashtead	1/9½	1/4½	Didcot	1/7½	1/3½	Llandudno	1/8½	1/4	Staines	1/8½	1/4
Ashton-under-Lyme	1/9½	1/4½	Diss	1/6	1/2	Llanelly	1/9½	1/4½	Stamford	1/8½	1/4
Aylesbury	1/7½	1/3½	Doncaster	1/9½	1/4½	London—			Stevenage	1/8½	1/4
Aylsham	1/6½	1/2½	Dorchester	1/7	1/2½	12m. radius	•1/11	1/5½	Stockport	1/9½	1/4½
Bagshot	1/7½	1/3½	Dorking	1/8	1/3½	12-15 m. radius	•1/10½	1/5½	Stockton-on-Tees	1/9½	1/4½
Banbury	1/7½	1/3½	Dover	1/7½	1/3½	Long Eaton	1/9½	1/4½	Stoke-on-Trent	1/9½	1/4½
Barnsley	1/9½	1/4½	Dovercourt	1/7½	1/3½	Longton	1/9½	1/4½	Stourbridge	1/9½	1/4½
Barnstaple	1/7½	1/3½	Driffield	1/8	1/3½	Loughborough	1/9½	1/4½	Stourport	1/9	1/4½
Barrow-in-Furness	1/9½	1/4½	Droitwich	1/9	1/4½	Louth	1/8	1/3½	Stowmarket	1/6½	1/2½
Barry	1/9½	1/4½	Dudley	1/9½	1/4½	Lowestoft	1/7½	1/3½	Stratford-on-Avon	1/8½	1/4
Basingstoke	1/7½	1/3½	Dunstable	1/8	1/3½	Luton	1/9	1/4½	Stroud	1/8½	1/4
Bath	1/9	1/4½	Durham City	1/9½	1/4½	Macclesfield	1/9	1/4½	Sunderland	1/9½	1/4½
Batley	1/9½	1/4½	Eastbourne	1/8½	1/4	Maidenhead	1/8½	1/4	Sutton Coldfield	1/9½	1/4½
Beaconsfield	1/8	1/3½	E. Glam. (Mon.Val.)	1/9½	1/4½	Maidstone	1/8	1/3½	Swaffham	1/6	1/2
Beccles	1/6	1/2	East Grinstead	1/7½	1/3½	Malvern	1/8	1/3½	Swanage	1/7½	1/3½
Bedford	1/9	1/4½	Edenbridge	1/7½	1/3½	Manchester	1/9½	1/4½	Swansea	1/9½	1/4½
Berkhamsted	1/7½	1/3½	Ely	1/6½	1/2½	Manningtree	1/6½	1/2½	Swindon	1/8	1/3½
Berwick	1/9	1/4½	Epping	1/9½	1/4½	Mansfield	1/9½	1/4½	Tamworth	1/9	1/4½
Beverley	1/9½	1/4½	Exeter	1/9	1/4½	March	1/6½	1/2½	Taunton	1/8	1/3½
Bexhill-on-Sea	1/8	1/3½	Exmouth	1/8	1/3½	Margate	1/7½	1/3½	Tenterden	1/7½	1/3½
Bideford	1/7½	1/3½	Fakenham	1/6½	1/2½	Market Harborough	1/8½	1/4	Thames Haven	1/9½	1/4½
Biggleswade	1/7½	1/3½	Falmouth	1/8	1/3½	Matlock	1/8	1/3½	Thetford	1/7	1/2½
Billericay	1/7	1/2½	Fareham	1/8½	1/4	Melton Constable	1/6	1/2	Thorpe Bay	1/9	1/4½
Birchington	1/7½	1/3½	Faversham	1/7½	1/3½	Melton Mowbray	1/8½	1/4	Todmorden	1/9½	1/4½
Birkenhead	‡§1/11	¶	Felixstowe	1/8½	1/4	Merthyr	1/9½	1/4½	Tonbridge	1/8	1/3½
Birmingham	†1/9½	†1/4½ ¶	Filey	1/8	1/3½	Middlesbrough	1/9½	1/4½	Torquay	1/9	1/4½
Bishop Auckland	1/9½	1/4½	Fleetwood	1/9½	1/4½	Middleton	1/9½	1/4½	Totnes	1/7½	1/3½
Bishops Stortford	1/8½	1/4	Flint	1/9½	1/4½	Middlewich	1/9	1/4½	Trowbridge	1/6½	1/2½
Blackburn	1/9½	1/4½	Folkestone	1/7½	1/3½	Milford Haven	1/8	1/3½	Truro	1/7	1/2½
Blackpool	1/9½	1/4½	Frinton-on-Sea	1/7½	1/3½	Morecambe	1/9½	1/4½	Tunbridge Wells	1/8	1/3½
Blyth	1/9½	1/4½	Frome	1/6½	1/2½	Morley	1/9½	1/4½	Uppingham	1/8	1/3½
Bognor Regis	1/7½	1/3½	Gainsborough	1/8½	1/4	Mundesley	1/6½	1/2½	Uttoxeter	1/8	1/3½
Bolton	1/9½	1/4½	Gateshead	1/9½	1/4½	Nantwich	1/9	1/4½	Wakefield	1/9½	1/4½
Bournemouth	1/8½	1/4	Gillingham (Kent)	1/8½	1/4	Nelson	1/9½	1/4½	Walsall	1/9½	1/4½
Bracknell	1/7½	1/3½	Glossop	1/9½	1/4½	Newark-on-Trent	1/9	1/4½	Walsden	1/9½	1/4½
Bradford	1/9½	1/4½	Gloucester	1/9	1/4½	Newbury	1/7½	1/3½	Walton-on-Naze	1/7½	1/3½
Bradford-on-Avon	1/6½	1/2½	Godalming	1/7½	1/3½	Newcastle-on-Tyne	1/9½	1/4½	Ware	1/9	1/4½
Braintree	1/7½	1/3½	Goole	1/9½	1/4½	Newcastle-u.-Lyme	1/9½	1/4½	Warminster	1/6½	1/2½
Brentwood	1/9	1/4½	Gosport	1/9	1/4½	New Forest	1/7½	1/3½	Warrington	1/9½	1/4½
Bridgwater	1/8	1/3½	Grantham	1/8½	1/4	Newmarket	1/7½	1/3½	Warwick	1/9½	1/4½
Bridlington	1/9	1/4½	Gravesend	1/9	1/4½	Newport, Mon.	1/9½	1/4½	Wellingborough	1/9	1/4½
Brighouse	1/9½	1/4½	Great Yarmouth	1/7½	1/3½	Newport Pagnell	1/7½	1/3½	Welwyn	1/8½	1/4
Brighton	1/8½	1/4	Grimsby	1/9½	1/4½	Northampton	1/9½	1/4½	Welwyn Gar. City	1/9½	1/4½
Bristol	1/9½	1/4½	Guildford	1/7½	1/3½	Norwich	1/9½	1/4½	Wells (Norfolk)	1/6	1/2
Broadstairs	1/7½	1/3½	Guisborough	1/8	1/3½	Nottingham	1/9½	1/4½	West Bromwich	1/9½	1/4½
Bromsgrove	1/9	1/4½	Halifax	1/9½	1/4½	Nuneaton	1/9½	1/4½	Westcliff-on-Sea	1/9	1/4½
Buckley	1/9½	1/4½	Hanley	1/9½	1/4½	Oakham	1/8	1/3½	Weston-super-Mare	1/8½	1/4
Bungay	1/5½	1/1½	Harpenden	1/8½	1/4	Oldham	1/9½	1/4½	Weybridge	1/8½	1/4
Burnham-on-Crouch	1/6	1/2	Harrogate	1/9½	1/4½	Ormskirk	1/9½	1/4½	Weymouth	1/7½	1/3½
Burnley	1/9½	1/4½	Hartlepools	1/9½	1/4½	Oxford	1/9	1/4½	Whitby	1/8½	1/4
Burslem	1/9½	1/4½	Harwich	1/7½	1/3½	Oxted	1/8	1/3½	Whitstable	1/7½	1/3½
Burton-on-Trent	1/9½	1/4½	Haslemere	1/7½	1/3½	Paignton	1/9	1/4½	Widnes	1/9½	1/4½
Bury	1/9½	1/4½	Hastings	1/7½	1/3½	Peterborough	1/9	1/4½	Wigan	1/9½	1/4½
Bury St. Edmunds	1/7	1/2½	Hatfield	1/9	1/4½	Plymouth	1/9½	1/4½	Wigton	1/8	1/3½
Buxton	1/9	1/4½	Haywards Heath	1/7½	1/3½	Pontefract	1/9½	1/4½	Willington	1/9½	1/4½
Byfleet	1/8	1/3½	Hednesford	1/9	1/4½	Pontypridd	1/9½	1/4½	Wilmslow	1/9½	1/4½
Cambridge	1/9½	1/4½	Hemel Hempstead	1/8½	1/4	Port Talbot	1/9½	1/4½	Winchester	1/8	1/3½
Canterbury	1/7½	1/3½	Henley-on-Thames	1/7½	1/3½	Portsmouth	1/9	1/4½	Windermere	1/8	1/3½
Cardiff	1/9½	1/4½	Hereford	1/7½	1/3½	Preston	1/9½	1/4½	Windsor	1/8½	1/4
Carlisle	1/9½	1/4½	Herne Bay	1/7½	1/3½	Pulborough	1/7½	1/3½	Wisbech	1/7	1/2½
Carnforth	1/9½	1/4½	Hertford	1/9	1/4½	Ramsgate	1/7½	1/3½	Witham	1/7½	1/3½
Castleford	1/9½	1/4½	Heysham	1/9½	1/4½	Reading	1/9	1/4½	Woking	1/8	1/3½
Caterham	1/9½	1/4½	Hitchin	1/8½	1/4	Redditch	1/9	1/4½	Wokingham	1/7½	1/3½
Chard	1/6½	1/2½	Hoddesdon	1/9	1/4½	Redhill	1/8	1/3½	Wolverhampton	1/9½	1/4½
Chatham	1/8½	1/4	Holt (Norfolk)	1/6	1/2	Ripon	1/8	1/3½	Woodbridge	1/7	1/2½
Chelmsford	1/9	1/4½	Horley	1/7½	1/3½	Rochdale	1/9½	1/4½	Worcester	1/9	1/4½
Cheltenham	1/8½	1/4	Horsham	1/7½	1/3½	Rochester	1/8½	1/4	Workington	1/8	1/3½
Chepstow	1/9	1/4½	Horwich	1/9½	1/4½	Rugby	1/9½	1/4½	Worksop	1/9	1/4½
Chertsey	1/8½	1/4	Huddersfield	1/9½	1/4½	St. Albans	1/9	1/4½	Worthing	1/7½	1/3½
Chester	1/9½	1/4½	Hull	1/9½	1/4½	St. Helens	1/9½	1/4½	Wrexham	1/9	1/4½
Chesterfield	1/9½	1/4½	Hunstanton	1/6½	1/2½	St. Neots	1/7	1/2½	Wroxham	1/7	1/2½
Chichester	1/7½	1/3½	Huntingdon	1/7	1/2½	Saffron Walden	1/6½	1/2½	Wycombe	1/8½	1/4
Chorley	1/9½	1/4½	Ilfracombe	1/7½	1/3½	Salisbury City	1/7	1/2½	Wymondham	1/6½	1/2½
Cirencester	1/7	1/2½	Ingatestone	1/8	1/3½	Salisbury Plain	1/8½	1/4	Yeovil	1/8	1/3½
Clacton	1/7½	1/3½	Ipswich	1/9	1/4½	Sawbridgeworth	1/8	1/3½	York	1/9½	1/4½
Cleveleys	1/9½	1/4½									

• Painters 1d. less than other Craftsmen. † Plus 2d. per working day. ‡ Plasterers 1/11½

¶ Tradesman's Labourers, 1/5½. Navvies and General Labourers 1/4½.

§ Joiners, Plumbers, Bricklayers, Tilers and Masons receive 2/- per week or 4d. per day Tool Money.

For Building Trade Wages in Scotland, see page 72.

PRICES CURRENT OF MATERIALS*

Note: Owing to the exceptional circumstances which prevail at the present time prices of materials should be confirmed by inquiry. The prices for soft woods are for cash on delivery, and are subject to adjustment when the increased price of £22 per standard for national released stocks is finally fixed.

At present linseed oil and genuine spirits of turpentine can only be supplied in cans in small quantities.

BRICKS, &c.

Delivered to site, City and Central Area, Full Lorry Loads.

	£ s. d.
Best Stocks	5 3 0
Second Hard Stocks	4 16 0

Per 1,000. Delivered at London Goods Stations.

2½ in. Phorpres. A discount of 6d. 1,000 only monthly account.	King's Cross Station per 1,000.	To sites in W.C. District. per 1,000
	s. d.	s. d.
Pressed	51 9	58 3
Keyed	53 9	60 3
Single Bullnose	71 9	78 3
Rustics	71 9	78 3
Whites	72 3	78 3

	£ s. d.
White Midhurst Facing Bricks (delivered London site)	3 12 6
Best blue Pressed Staffs. (London Stns.)	10 2 0
Do. Bullnose (London Stns.)	10 12 0
Blue Wire Cuts (London Stns.)	8 19 6
Best Stourbridge Fire Brick (London Stns.):— 2½ in. 9 3 6 3 in.	11 1 0

GLAZED BRICKS. (London Stns.)

Best White Ivory		D'ble Str'tch'rs	36 10 0
and Salt Glazed		D'ble Headers	33 10 0
Stretcher	28 0 0	One side & two ends	37 10 0
Headers	27 10 0	Two sides & one end	38 10 0
Quoins, Bullnose and 4½in. Flats	34 10 0	Splays and Squints	36 0 0

Second Quality, £2 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours. Hard Glaze, £5 10s. extra over white.

PARTITION SLABS.

Delivered London Area.

"PHORPRES" HOLLOW PARTITION BLOCKS.

2" per yd. sup.	2 3	3" per yd. sup.	2 9
2½" " "	2 6	4" " "	3 1

CLINKER CONCRETE.

2" per yd. sup.	1 6	3" per yd. sup.	2 0
2½ " "	1 8	4" " "	2 4

CRANHAM TERRA COTTA.

2" per yd. sup.	3 0	3" per yd. sup.	3 8
2½" " "	3 6	4" " "	4 7

HEMPSTEAD—KEYED TWO SIDES.

12" x 9" x 2"	2 6	12" x 9" x 3"	3 0
12" x 9" x 2½"	2 9	12" x 9" x 4"	3 9

Per yard super d/d. Free on site, London.

SAND.

Thames Ballast	8 6	per yd. delivered 2 miles radius Paddington.
Pit Ballast	8 6	" "
Pit Sand	10 0	" "
Washed Sand	13 0	" "
¼ in. Shingle	8 0	" "
¼in. Broken Brick	12 6	" "
Fan Breeze	8 3	" "

CEMENT.

Best British Portland Cement. Standard Specification delivered London Area.

	£ s. d.
4 ton loads and upwards site. Per ton	2 9 6
3 ton to 4 tons site	2 12 6
Alongside Vauxhall in 80 ton lots	2 7 0
"Ferrocrete" Rapid Hardening Cement—	
4 ton loads and upwards site	2 15 6
1 ton to 4 tons site	2 18 6
Alongside Vauxhall in 80 ton lots	2 13 0

Stored in Reserved Bins at works. 1/6 per ton extra.

"Aquacrete" Water Repellent, "Blue Circle" cement, 30/- per ton extra or ordinary "Blue Circle" prices.

"Colorcrete" Nos. 1 and 2. Coloured Rapid Hardening Portland Cement 3 19 6

"Colorcrete" not rapid hardening, according to colour, from £7 to £15 10s. per ton.

"Snowcrete" White Portland Cement 9 5 0

Super Cement (Waterproof), *bags extra* 3 19 6

NOTE.—Paper bags will be charged at the rate of 6/- nett per ton. Jute sacks charged 1s. 9d. nett each and 1/6 nett each allowed if returned to works within two weeks, in good condition.

Carriage will be paid by makers on returned empty jute sacks.

Roman Cement £7 5 Keene's Cement, White £6 10 0

Parian Cement 6 10 " " Pink 6 5 0

Cementone Colours for cement according to tints per cwt. from £2 16s. 0d.

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	3 12 6	Sirapite, Coarse	4 3 0
" White	4 0 0	" Finish	4 11 0
Pioneer	4 3 0		

Above prices for 4-ton loads and over London Area.

Best Ground Blue		Grey Stone Lime	2 12 6
Lias Lime	2 17 6	Chalk Lime	2 12 6
Granite Chippings	1 10 0	Hair per cwt.	2 7 6

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d., if returned in good condition within three months, carriage paid.

Stourbridge Fireclay in sacks 37s. per ton at rly. dep.

STONE.

PATH STONE.—Delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube 2 11½

RIVER STONE—RANDOM BLOCK—

Free on rail at Seaton Station, per ft. cube	2 3
Delivered free on rail Nine Elms, S.R. "	3 1½

Selected approximate size one way, 1d. per cubic ft. extra, selected approximately three sizes or for special work, 3d. per cubic ft. extra.

PORTLAND STONE—

	s. d.
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 6
Do. do. delivered on road waggons as above stations, per ft. cube	4 6
White basebed 3d. per ft. cube extra.	
NOTE.—1d. per ft. cube extra for every ft. over 20 ft. *average* and ½d. beyond 30 ft.	

HOPTON-WOOD STONE—

F.O.R. Quarries, Wirksworth, Derbyshire, Random blocks from 10 ft. and over F.ft.cb.	14 0
Sawn two sides	22 6

HOPTON-WOOD STONE—

Sawn three or four sides	27 9

YORK STONE, BLUE—*Robin Hood Quality.*

Delivered at any Goods Station, London.

6 in. sawn two sides landings to sizes (under 40 ft. super) per ft. super	5 6
6 in. rubbed two sides, ditto "	6 3
8 in. sawn two sides slabs (random sizes) "	2 7
2 in. to 2½ in. sawn one side slabs (random sizes) (paving) "	1 8½
1½ in. to 2 in., ditto "	1 4½

HARD YORK—

Delivered at any Goods Station, London.

Scrappled random blocks. per ft. cube	6 10
6 in. sawn two sides landings to sizes (under 40 ft. super) per ft. super	5 7½
6 in. rubbed two sides, ditto "	6 9
4 in. sawn two sides slabs (random sizes) "	3 5
3 in. ditto ditto "	2 8
2 in. self-faced random flags Per yd. super	8 9

CAST STONE.

Delivered in London are in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Sills, 10s. 0d.

HARD WOOD.

1 INCH AND UP THICK.

	£ s. d.
Average price for prime quality.	
Dry Austrian Wainscot, per ft. cube	0 17 0
Dry American and/or Japanese Figured Oak, per ft. cube 10 6 to	0 13 0
Dry American and/or Japanese plain Oak, per ft. cube	0 11 6
Dry sq. edged Honduras Mahogany, per ft. cube	0 15 0
Dry log-cut Honduras Mahogany, per ft. cube 12 6 to	0 16 0
Dry Cuba Mahogany, per ft. cube	0 18 0
Dry Teak, per ft. cube	0 14 0
Dry American Whitewood, per ft. cube	0 10 6
Dry Australian Walnut, per ft. cube	0 19 0
Dry Queensland Silky Oak, per ft. cube	0 12 6
Dry African Mahogany, per ft. cube	0 10 0
Dry African Whitewood, per ft. cube	0 8 0
Dry English Wainscot Oak, per ft. cube	0 16 0
Best Scotch Glue, per cwt.	3 0 0
Liquid Glue, per cwt. 4 7 0 to	5 10 0

SOFT WOOD.

MERCHANTABLE BRITISH COLUMBIAN PINE.

	Minimum. £ s. d.	Maximum. £ s. d.
Scantlings in imported sizes, 2in. by 3in. to 4in. by 11in.	43 10 0	53 0 0

Having secured the Contract— What about the Steel Scaffolding?

TUBULAR

SCAFFOLDING

For the lowest Prices apply to the Oldest Firm in The Scaffolding Trade.

STEPHENS & CARTER LTD.

The British Steel Scaffolding Co.

731-761, HARROW RD., N.W.10.

Telephone No. Ladbroke 1191 (6 lines).

PLANED BOARDS.

PRIME CLEAR BRITISH COLUMBIAN PINE.

	Per standard. £ s. d.
1in. by 11in. } 1in. by 9in. }	67 13 0

	Per square. s. d.
1in. plain edge flooring	59 0
1¼in. ditto	66 6
1in. tongued and grooved	52 0
1¼in. ditto	66 6

MATCHING.

	Per square. s. d.
⅜in.	37 6
½in.	42 0
1in.	55 0

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	34 17 6	18 by 10	19 5 0
22 by 12	29 0 0	18 by 9	17 15 0
22 by 11	26 15 0	16 by 10	16 17 6
20 by 12	26 2 6	16 by 8	13 10 0
20 by 10	24 0 0		

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. Per 1,000 f.o.r. London

Best machine-made tiles from Broseley or Staffordshire district	£5 10 0
Ditto hand-made ditto	6 10 0
Ornamental ditto	6 15 0
Hip and valley tiles (per dozen) Hand-made	0 11 6
Machine-made	0 11 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

R.S. Joists, cut and fitted	£22 10 0
Plain Compound Girders	25 0 0
" Stanchions	27 10 0
In Roof Work	32 10 0

NOTE.—These prices are for standard pieces and no special pieces of an awkward nature.

MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£ s. d.	Diameter.	£ s. d.
¼ in.	22 5 0	⅝ in. to ½ in.	20 15 0
⅜ in.	21 5 0	¾ in. to 2¼ in.	20 5 0

WROUGHT TUBES AND FITTINGS.

Deliveries from works.

Deliveries from London stock further 2½% gross.

	Tubes. ¼"/6" %	Tubulars. ¼"/6" %	Fittings. 10/17 and 19/24 %	Flanges. ¼"/2" %	Flanges. 2½"/6" %
Light weight	55½	—	43	51½	43
Heavy weight	48½	48½	40½	41½	50½
Galv. lightweight	44½	—	39½	40½	49½
Galv. heavyweight	35½	35½	31½	30½	41½

Tubes and tubulars sizes ¼"/¾" inclusive, charged extra of 5% less gross.

Fittings. Figs. 25/34 5% less gross discount.

Terms.—Nett cash end of month following date of invoice. Carriage paid on lots of £10 nett value and over.

C.I. HALF-ROUND GUTTERS—London Prices ex Works. per yd. in 6 ft. lengths.

	Gutters.	Nozzles.	Stop ends.
3 in.	1/4½	1/1	4d.
3½ in.	1/5½	1/2½	4d.
4 in.	1/5½	1/4½	6½d.
4½ in.	1/6½	1/8	7½d.
5 in.	1/10½	1/11½	8d.

O.G. GUTTERS.

3 in.	1/9	1/5½	4½d.
3½ in.	1/11½	1/5½	6d.
4 in.	1/11½	1/6½	7d.
4½ in.	2/0½	1/9½	8d.
5 in.	2/6	2/0½	9½d.

RAIN WATER PIPES.

Per yd. in 6 ft.	Pipe.	Bends.	Branches. Stock angles.
2 in.	2/0½	1/4½	2/0
2½ in.	2/1½	1/6½	2/4½
3 in.	2/7½	1/11½	2/10½
3½ in.	3/1	2/3½	3/4½
4 in.	3/6½	2/9½	4/0½

NETT PRICES.

Tonnage allowance—4-ton lots, 5 per cent. 2-ton lots, 2½ per cent.

L.C.C. COATED SOIL PIPES.—London Prices, ex Stock.

Per yd. in 6 ft.	Pipe.	Bends.	Branches.
2 in.	3/4½	2/4½	2/10½
2½ in.	4/0½	2/7½	3/7½
3 in.	4/4½	2/10½	4/3½
3½ in.	4/8½	3/7½	5/0½
4 in.	4/10	4/0½	5/9½

L.C.C. COATED DRAIN PIPE.

	Pipe.	Bends.	Branches.
3 in. per yd. in 9 fts. cwt. qr. lbs.	5/5	6/3	9/11
4 in. 1 1 20.	7/11	7/1	12/6
5 in. 1 2 22.	9/7	12/9	19/3
6 in. 2 0 6	11/5	14/8	25/6

Gaskin 65/- per cwt.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information. Prices are subject to 2½ per cent. cash discount.

PRICES CURRENT OF MATERIALS—(*contd*).

	Per ton basis in London. £ s. d.		£ s. d.
IRON.—Staffordshire Crown, Merchant quality	17 2 6	to	18 7 6
IRON.—Staffordshire Marked Bars	20 0 0	to	22 0 0
Mild Steel Bars	19 12 0	to	21 2 0
Mild Steel Hoops	21 6 0	to	21 16 0
	Ex Merchant's Stock, per ton (two-ton lots).		
Soft Steel Sheets, C.R. and C.A.—			
20 gauge	24 17 6	to	27 5 0
24 gauge	25 2 6	to	27 0 0
26 gauge	25 17 6	to	27 15 0
Galvanised Corrugated Sheets, 6 ft. to 9 ft.—			
20 gauge	27 1 3	to	28 6 3
24 gauge	27 11 3	to	28 16 3
26 gauge	28 16 3	to	30 11 3
Galvanised Flat Sheets, C.R. and C.A.—			
20 gauge	28 11 3	to	30 8 9
24 gauge	29 1 3	to	30 18 9
26 gauge	30 6 3	to	32 3 9
	Per ton. £ s. d.		£ s. d.
Cut Nails, 3 in. and up	26 0 0	to	27 10 0
	ALL NETT.		

METAL WINDOWS.—Standard sizes, suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1s. 4d. to 1s. 7d. per foot super.

COPPER.

Seamless copper tubes (basis)	per lb.	1/3
Strong sheet	,,	1/6
Thin sheet	,,	1/7
Copper nails	,,	1/6
,, wire	,,	1/6

PLUMBERS' BRASS WORK.

Delivered in London.
Stamped by Met. Water Board.

CRUTCH HEAD S.D. BIB COCKS FOR IRON. EASY CLEAN.

½ in.	¾ in.
34/-	53/- per doz.

CHROMIUM PLATED TOILET S.D. BIB COCKS FOR IRON. EASY CLEAN.

½ in.	¾ in.
50/-	68/- per doz.

S.D. STOP COCKS FOR IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	
37/6	53/-	87/-	202/-	288/-	460/-	per doz.

S.D.S. COCKS WITH TWO UNIONS FOR LEAD.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	
47/-	75/6	120/-	226/-	360/-	588/-	per doz.

DOUBLE NUT BOILER SCREWS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	
8/10	9/9	15/9	27/3	44/-	63/6	per doz.

HEAVY CROYDON BALL VALVES. SCREW IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	
45/-	73/-	120/-	204/-	260/-	per doz.

CAPS AND SCREWS.

1½ in.	1¾ in.	2 in.	3 in.	3½ in.	4 in.	
10/6	12/9	19/3	34/-	48/-	53/-	per doz.

BRASS SLEEVES.

1½ in.	2 in.	3 in.	3½ in.	4 in.	
9/9	12/6	22/6	33/-	42/-	per doz.

DRAWN LEAD TRAPS WITH BRASS CLEANING SCREWS.

	1¼ in.	1½ in.	2 in.	3 in.	
8 lb. Lead P...	29/-	38/-	54/-	93/-	per doz.
8 lb. Lead S...	36/-	42/-	67/-	120/-	,,

SOLDER.—Plumbers, 1/5. Tinmen's, 1/8. Blow pipe, 1/10 per lb.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil, in drums	per gallon	0 5 4
Boiled ,, ,, in drums	,,	0 5 7
Turpentine, in drums (10 gals.)	,,	0 5 3
Genuine Ground English White Lead, per ton (In not less than 5-cwt. casks).		61 0 0
Extra for 1-cwt. kegs over 5-cwt. casks is 2/9 cwt.		
GENUINE WHITE LEAD PAINT "Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Morganwyte," "Polacco," "J" Brand, and other best brands (in 14 lb. tins) not less than 5-cwt. lots	per ton delivered	83 10 0
Red Lead, Dry (packages extra)	per ton	52 0 0
Best Linseed Oil Putty (1 ton lots)	per cwt.	0 17 1½
Size. XD quality	fkn.	0 3 6
Turpentine substitute can be obtained and prices vary according to the quality from 2/9 gallon upwards.		
		£ s. d.
SNOWCEM CEMENT PAINT	per cwt.	2 16 0
C.M.C. CAMOUFLAGE PAINT	per cwt.	2 16 0

VARNISHES, &c.

		Per gallon.
Oak Varnish	Outside	0 14 0
Fine do.	,,	0 16 0
Fine Copal	,,	0 18 0
Pale Copal	,,	1 0 0
Pale Opal Carriage	,,	1 4 0
Best do.	,,	1 12 0
Floor Varnish	Inside	0 18 0
Fine Pale Paper	,,	0 18 0
Fine Copal Cabinet	,,	1 2 0
Fine Copal Flatting	,,	1 0 0
Hard Drying Oak	,,	0 18 0
Fine Hard Drying Oak	,,	0 19 6
Fine Copal Varnish	,,	1 0 6
Pale do.	,,	1 12 0
Best do.	,,	1 2 6
Best Japan Gold Size		1 12 6
Best Black Japan		0 10 0
Oak and Mahogany Stain (water)		0 12 0
Brunswick Black		0 7 6
Berlin Black		0 14 0
Knotting (patent)		0 15 0
French and Brush Polish		0 12 0
Liquid Dryers in Terebene		0 9 0
Cuirass Black Enamel		0 7 0

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

ORDINARY GLAZING QUALITY (O.Q.) AND SELECTED GLAZING QUALITY (S.Q.).

PER FOOT SUPER.

In sizes not exceeding 80 in. long or 48 in. wide or 110 united inches.

	O.Q.	S.Q.
18 oz. in 300 ft. cases	2½d.	2¾d.
24 oz. ,, 200 ft. ,,	3½d.	4d.
26 oz. ,, 200 ft. ,,	3¾d.	4¼d.
32 oz. ,, 200 ft. ,,	5¼d.	6¼d.
24 oz. ,, 300 ft. ,,	3¾d.	3¾d.
26 oz. ,, 300 ft. ,,	3¾d.	4¼d.
32 oz. ,, 300 ft. ,,	5¼d.	6¼d.
18 oz. Obscured Sheet		5¼d.
24 oz. Obscured Sheet		6¼d.
Fluted, 21 oz.		9d.
Enamelled, 18 oz.		5¾d.
,, 24 oz.		6¾d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE AND FIGURED CATHEDRAL, ETC., IN CUT SIZES.

	Per ft.
Rolled plate, ¼ in.	5½d.
Rough cast double rolled, ⅜ in.	6¼d.
Rough cast double rolled, ½ in.	6¾d.
Figured rolled, and Cathedral, white	6¾d.
Figured rolled and Cathedral, tinted	9½d.
Rolled Sheet	6d.
Reeded, Broad Reeded, Cross Reeded and Chevron Reeded, ¼ in. thick	0 10½

Rolled plate is the same price as rough cast double rolled.

	Per ft. s. d.
Wire Rolled, ¼ in. thick	0 9½
Wired Cast, ¼ in. thick	0 9½
Georgian Wired Cast	0 10
"Calorex" Sheet, 21 oz.	2 6
,, ,, 32 oz.	4 0
,, Cast, ¼ in. thick	0 10
,, ,, ⅜ in. thick	1 0
,, ,, ½ in. thick	1 2
Non Actinic Glass, ¼ in. thick	0 9½
,, ,, ,, ⅜ in. thick	1 0
,, ,, ,, ½ in. thick	1 2

"VITA" GLASS.

	Per ft. s. d.
"Vita" Plate Glass, about ⅛ thick.	
To 7 ft. super	5 0
Over 7 ft. super	7 6
"Vita" Sheet Glass, about 18/20 oz.	2 0
Cathedral "Vita" Glass:	
¼" thickness	2 0
5/16" ,,	3 0
⅜" Georgian Wired "Vita" Glass	3 6

LEAD, &c.

(Delivered in London.)	Per ton. £ s. d.
LEAD.—Sheet, English, 4 lb. and up	34 10 0
Pipe in coils	34 0 0
Soil pipe	39 10 0
Compo pipe	41 5 0

NOTE.—Country delivery, 20/- per ton extra, lots under 3 cwt. 4/- per cwt. extra and over 3 cwt. and under 5 cwt., 2/6 per cwt. extra. Cut to sizes, 4/- per cwt. extra.

Old lead, ex London area, at Mills ..... per ton £18 0 0

BUILDING TRADE WAGES IN SCOTLAND

Following are grade rates authorised by the Scottish N.J.C. from October 1. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur.

Grade Classification	A	A¹	A²	A³	B	B¹
Craftsmen	1/10	1/9½	1/9	1/8½	1/8	1/7½
Labourers	1/4½	1/4½	1/3½	1/3½	1/3	1/2½

Aberdeen	A	Dumfriesshire	A¹	Inverness	*
Ayrshire	A	Dundee	A	Inverurie	A¹
Banff	B	Dunoon	A	Kincardineshire	A²
Berwickshire	A²	East Fife	A	Kinross-shire	A
Bridge of Allan	A	East Lothian	A	Lanarkshire	A
Broughty Ferry	A	Edinburgh	A	Midlothian	A
Clackmannanashire	A	Fifeshire	A	Monifieth	A
Doune	A	Forfarshire	A³	Moray and Nairn	B
Dunblane	A	Glasgow	A	Newport	A
Dumbartonshire	A	Greenock	A	Peebleshire	A¹
Dumfries	A¹	Hamilton	A	Perth	A

Perthshire	A¹
Peterhead	A¹
Renfrewshire	A
Rothesay	A
Roxburghshire	A¹
St. Andrews	A
Selkirkshire	A¹
Stewartry	A¹
Stirlingshire	A
Stornoway	A²
Tayport	A
West Lothian	A

* This town has its own rates: Masons, 1/8; Carpenters, 1/8; Slaters, 1/8; Plumbers, 1/8½; Plasterers, 1/9 but 1/9½ is paid owing to the scarcity at present; Painters, 1/8 and Labourers, 1/3½.

The information given in this table is copyright. Rates of wages in England and Wales are given on page 70.

THE SCOTTISH BUILDER

ABERDEEN.—SUB-STATIONS.—The T.C. has decided to apply to the Electricity Commissioners for permission to proceed with an electricity sub-station, at £13,095.—Subject to the Secretary of State for Scotland, the Council also agreed to erect three new police substations, at £1,530.

ALLOA.—PREMISES.—Plans prepared by their own architects for the new buildings for Messrs. Archibald Arrol & Son (Brewers), Ltd.

EDINBURGH.—BUILDING.—The Dean of Guild Court has approved of the following plans: James H. Lamont & Co., canteen; Princess Margaret Rose Hospital for Crippled Children, gas decontamination room; D. & J. Borthwick, offices.

GLASGOW.—CANTEEN.—Plans prepared by Harland & Wolff, Ltd., Govan, for new canteen.

GLASGOW.—ADDITIONS.—Plans are being prepared for alterations and additions for the Kelvindale Laundry Co., Ltd. The architects are Messrs. Miller & Black, 132, West Regent-street, Blythswood.

GLASGOW.—HOUSES.—Plans prepared for 18 houses, and hostel, etc. The architect is Mr. W. MacNab, the Housing Director's Office.

INVERNESS.—EXTENSIONS.—The T.C. has approved in principle proposal of the Burgh and County Joint Hospital Board to carry out an extension of the nurses' home at Culduthel at £5,715. It was reported that, subject to a minor alteration, the Department of Health for Scotland had approved the plans.

STIRLING.—ADDITIONS.—Plans prepared for additions at the Scottish Bacon and Ham Curing Co.'s premises. Messrs. Simpson, McMichael and Simpson, architects, 16, King-st.

Fencing and Gates

For Government Contracts and similarly important present-day requirements, let Boulton & Paul carry the whole of your Fencing commitment. Skilled erectors, first-class materials—in all, **a dependable service for urgent contracts.** Ask for Estimates. **STEEL BUNKS** can be supplied in large or small quantities. For quotations 'phone Norwich 851 (London: VIC. 8001) or write

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NEW BUILDINGS IN LONDON

MIDDLESEX.—SCHOOL.—The E.C. propose school at Northwood Hills. Plans are by the County Architect, Middlesex House, 20, Vauxhall Bridge-rd., London, S.W.1.

Rates of Wages.

Owing to the number of inquiries which have reached us concerning rates of wages increases, we would make clear that no change was made on January 1. No alterations are likely to be made before February 1.

TRADE NEWS

Asphalt Company's Misfortune.

The Seyssel Asphalte Co., Ltd., with which is associated Claridge's Patent Asphalte Co., Ltd., lost all their books, records and printed matter, which cover a period of 103 years of business activity, when their offices at Moorgate Station Chambers, London, E.C., were reduced to ashes by enemy fire bombs on December 29.

The business is being carried on at the address of Mr. G. F. Glenn, managing director, from West Lodge, West Byfleet, Surrey (telephone Byfleet 424), as a temporary arrangement, where all matters will have prompt and efficient attention.

Waterproofing Solutions.

In wintry weather the waterproofing of air-raid shelters and the carrying out of concreting are subjects of considerable interest. Messrs. Sealocrete Products, Ltd., have specialised in the production of solutions of use in these directions. "Sealocrete" double-strength "Premix" solution is a liquid for incorporation in the gauging water when mixing concrete, either for mass-concreting or for renderings or floor toppings. Besides permanently waterproofing the concrete, "Premix" is claimed to assist in rapid hardening and in rendering the floors dustproof and oilproof.

The "Premix" solution is also of use in assisting concreting in frosty weather. Sealocrete Products, Ltd., have issued a series of leaflets describing the application of this liquid to special problems, such as waterproofing Anderson shelters, trench shelters, and the laying of industrial floors. Copies of these may be obtained from Atlantic Works, Macbeth-street, Hammersmith, W.6.

Electric Tools.

A news sheet issued by S. Wolf and Co., Ltd., Pioneer Works, Hanger-lane, London, W.5, contains the information that the new "Wolf" "Dartdrills" will be available for distribution in February. The machines are designed as light duty ¼-in. and ⅜-in. models, each drill being provided with a powerful universal motor for both D.C. and single-phase A.C. 25-60 cycle supplies. Standard windings are: 50 volts, 100/120 volts, 130 volts, 200/220 volts and 220/250 volts. We are informed that the general design of the "Dartdrill" is unique, the interior being assembled within two half-castings. Bearings are of the self-lubricating type and a ball-thrust race is fitted on the drill spindle. A ¼-in. model is illustrated on this page.

THE "DART DRILL." (See this page.)

Sheeting for Emergency Repairs.

The demands made upon established materials suitable for carrying out emergency repairs to windows, ceilings and roofs of buildings damaged by enemy action give added interest to a new sheeting which, following extensive tests, has been placed on the market by Messrs. William Palfrey, Ltd.

"Palfpap" (as the material is called) is a sheeting composed of strong canvas-like material firmly cemented to a base of stout water-resistant brown paper. It is extremely strong, and we have been unable to tear it, though it is easily cut to required size with scissors. Being opaque, it serves as blackout and also gives good insulation against cold and heat. It is supplied in 100-yard lengths, and in widths of 40 in. and 60 in. This makes it extremely useful for screening large windows in shops, offices, etc.

"Palfpap" has, we learn, been used since its introduction four months ago by certain railway companies and by departments of the Ministry of Works and Buildings. Details, prices and samples are available from the sole agents, Messrs. C. F. Anderson and Son, Ltd., Harris Wharf, London, N.1.

BUILDING ILLUSTRATED

"BURNE-JONES HOUSE," FULHAM.

This block of flats was built by Taylor Woodrow Construction, Ltd., of Southall. Sub-contractors were: Dark purple S.F.H.M. facings, Thos. Lawrence and Sons; stock bricks, John Knowles and Co.; precast granite, Stent Precast Concrete, Ltd.; cast stone, W. C. Richardson; Columbian pine doors, Simms, Sons and Cooke, Ltd.; lime, Eastwoods; external scaffolding, Scaffolding (Gt. Britain), Ltd.; steelwork, Redpath, Brown and Co.; reinforced concrete windows, J. A. King and Co., Ltd.; plasterwork and *in situ* granolithic work, W. A. Telling Ltd.; floors, Helical Bar and Eng.; paintwork, Direct Spray Process Co., Ltd.; air grids, J. C. Edwards (Ruabon), Ltd.; glazing, Leay Glazing Service, Ltd.; glazed wall tiling, A. W. Whitton and Co.; roof tiling (using Colthurst Symons' double "Roman" tiles), Wilson and Wylie; asphalt, The General Asphalte Co.; coloured asphalt, The Limmer and Trinidad Lake Asphalt Co.; metal casements, Crittalls; and living-room grates, Eagle Range and Grates Co., Ltd.

The flats were planned and designed by the Borough Engineer and Surveyor, Mr. A. F. Holden, M.Inst.C.E., assisted by Mr. E. A. H. MacDonald, A.R.I.B.A., and members of the architectural staff.

DON'T TENDER UNSUCCESSFULLY

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TENDERS

The Editor welcomes authentic information for this feature from architects, surveyors or contractors. Items should reach 4, Catherine-street, Aldwych, W.C.2, not later than Tuesday morning.

Tenders for A.R.P. work will be found under "A.R.P. Schemes."

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government departments*.

Bath.—Works for T.C.: Electric wiring, destructor works: *C. P. Vanstone, £105 8s. 10d.; repair to cottages: *Lock Bros., £308 5s.

Colchester.—Pipeline, comprising 2,203 lin. yds. 12-in. dia., 358 lin. yds. 10-in. dia. and 1,568 lin. yds. 9-in. dia. pipe, for T.C. H. Collins, Boro' Sur., 3, Bank-passage: *West Heath (Contractors), Ltd., 34a, Gaolgate-st., Stafford, £9,246 2s. 10d.

Essex.—Works for C.C.: Extensions to the boiler house at an emergency hospital: *H. R. Barber, Writtle, £249.—Making-up certain ground at a county hospital: *W. and C. French, Ltd., Buckhurst Hill, £259 6s. 4d.

Hereford.—Work in connection with Holme Lacy road improvement, for T.C.: *Asphalt and Public Works, Ltd., £2,161 14s. 2d.

Horncastle.—Extension of water supply to council houses, for R.D.C.: *R. A. Daubney, Boston.

Kettering.—Installation of a low-pressure hot-water system at hospital, for Northamptonshire C.C.: *J. E. Smith (Higham Ferrers), Ltd., 11, College-st., Rushden, £220.

¶London (Air Ministry).—Contracts placed to the value of £500 or over for the week ended Dec. 28:—

Building and civil engineering work: B. Surfley & Co., Ltd., London.

General maintenance work: Rattee & Kett, Ltd., Cambridge.

¶London (War Dept.).—Works contracts placed for week ended Dec. 28:—

Hutting (erection): Kirk & Kirk, Ltd., Atlas-wks., Putney, S.W.15; E. J. Logan, 138b, West-hill, Putney, S.W.15; Eames & Calverley, Ltd., Ringmer, Sussex; Janes (Builders), Ltd., Buckingham-av., Trading Estate, Slough; Rogers Bros., Ltd., Station-rd., Felixstowe; F. Parham, Ltd.; Eva-rd., Gillingham; W. F. Rees, Ltd., 20, Lockyer-st., Plymouth; Wm. Birch & Sons, Ltd., Spen-la., York; Haymills (Contractors), Ltd., Hanger Green, Western-av., W.5; James Ross & Son, Brookhill-av., Belfast; Cussins (Contractors), Ltd., 7, Park-la., Mayfair, W.1.

Miscellaneous works: John Turner & Sons (Preston), Ltd., William Henry-st., Preston; Franks, Harris Bros., Ltd., Station-approach, Guildford; T. McKee & Sons, Ltd., Imperial Building-wks., Ravenhill-av., Belfast; The Marbolith Flooring Co., Ltd., 29, Albert-embankment, S.E.11; and Stedman Bros., New North wks., New North-rd., Barkingside, Ilford.

Building work: E. E. Stevens & Son, Ltd., Breedon-st., Long Eaton, Notts; Walker (Tooting), Ltd., Cadnam House, Beddington-la., Croydon; C. Firbank & Son, Ltd., Leagrave-rd., Luton; Cropley Bros, Ltd., Imperial wks., Church-rd., Epsom; McMullan Bros., 69a, Aigburth-park, Strandtown, Belfast; Alex. Hall & Son (Builders), Ltd., 15, Mid Stocket-rd., Aberdeen; and J. D. Stewart, Ltd., 102, Bath-st., Glasgow.

Newcastle (Staffs).—Works for T.C. A. Cotton, Boro.' Sur.: Mess room at gas works, *A. Plevin & Sons, Mackenzies-bldgs., Newcastle; internal painting and decorations, *Eli Bagguley & Son, 28, Bagnall-st., Newcastle, £153.

Newton Abbot.—Public surface shelter in Kingsteignton, for R.D.C. W. J. Luxton, Surveyor:—

Weaver Bros.	£183 10
T. F. Clarke & Sons	157 9
†Cumbley & Sons, Ltd.	149 9

All of Kingsteignton.

Rotherham.—Repairs to flat roofs at council school, for E.C. Vincent Turner, Boro.' Eng.: *J. Hadfield & Sons, Ltd., Effingham-st., Sheffield, £240.

Salford.—Demolishing Albert Park branch library, for T.C.: *W. Kayley, Ltd., Manchester.

Sunderland.—Building and equipment of permanent feeding kitchens, for E.C. O. H. Mark, architect, St. John-st.: *Direct Labour.

Walthamstow.—Part resurfacing of playground at boys' school, for T.C.: *E. C. MacDermot & Co.

CURRENT AND PROPOSED BUILDING WORK*

Bath.—T.C. to carry out alterations and decorations to properties in New Bond-st., Northgate-st., and Barton-court.

Batley.—T.C. decided to complete four shops. Plans by T. Mossopp, Boro' Sur.—Trustees of Gospel Hall, Mount Pleasant, propose improvements to building, at £300.

Blackpool.—T.C. approved: Alterations and additions "Railway" Inn, Bonny-st., for Blackpool Tower Co., Ltd.

Bromsgrove.—U.D.C. approved: Maternity ward for Board of Governors, General Hospital.

Burnley.—E.C. to acquire boys' school for adaptation as a gymnasium. Plans by J. L. Beckett, Boro' Eng.

Crowle. — Farmers' Union acquired premises for conversion into potato factory.

Essex.—C.C. recommend £100 on repair work to a girl's school; lateral work at a children's home, at £142; repairs to balcony roofs at a hospital, at £270; garage at police station, at £207 12s.

Keighley.—Health Department propose day nursery for 40 children.

Kendal. — T.C. approved: Alterations, Union Tavern, for J. Alexander and Sons, architect, M. G. Shaw.

Kettering.—Catholic authorities propose adaptation of old church as Catholic school for evacuees.

Leeds.—City Council to spend £600 on completion of shops for use as community centre.

Liverpool.—T.C. recommended £596 in respect of limewashing of roof timbers in various libraries; clinic at a hospital, subject to M.H. Plans and estimates to be prepared by City Architect; to provide and equip roof workshop extension at a college, at £1,890.—M.H. sanctioned borrowing by Council of £1,973 for conversion work at hospital.

Llandudno.—U.D.C. to extend protection of sea front by 50 ft. Plans by W. T. Ward, Sur.

Macclesfield.—Health Committee propose maternity block at hospital.

Maidenhead.—T.C. approved: Extension to warehouse, St. Martin Preserving Co., Ltd.

Manchester.—M.H. have consented to further borrowing, amounting to £6,876, in connection with extensions to school.

Manchester.—Lord Bishop of Salford, Wardley Hall, Swinton, proposes conversion of lodge into Catholic church. Plans by W. Ellis, architect, Union Bank-chams., Hardshaw-st., St. Helens.—G. Brady and Co., Ltd., New Islington-works, proposes works.

Mansfield.—T.C. proposes alterations to two schools for nursery classes.

Melton and Belvoir.—R.D.C. propose mortuary.

Morecambe and Heysham.—T.C. received sanction to borrow £3,659 for electricity substation.

Newcastle-under-Lyme. — E.C. approved plans for gymnasium at modern school.

Northampton.—T.C. recommend adaptation of two cottages, at £492; two water supply schemes, £6,050; additional open water tank, £1,000; extensions to nursery school, £400-£500.—Plans passed: Reconstruction of temporary building, G. Civil, Ltd.

Northumberland.—County E.C. included in its annual estimates £700 for improvements to schools.

Rotherham.—T.C. approved: Two works' chimneys, Ambrose Sharlow and Co., Ltd.

Stafford.—R.D.C. acquired premises for adaptation as council offices.

Stamford.—T.C. approved: Alterations, Castle Hotel, Castle-st., for P. Phipps and Co., Ltd., brewers, Northampton.

Stoke-on-Trent.—North Staffordshire Egg Producers, Ltd., propose premises.

Stoke-on-Trent.—T.C. approved: Cardigan Estates, Ltd., alterations; North Staffs Royal Infirmary, workshops and stores.

Sunderland.—J. A. Jobling and Co., Ltd., Wear Glass-wks., to build two tall chimneys at works.—Plans prepared by firm for workshop store for S. P. Austin and Sons.

Swansea.—School Attendance and Child Welfare Sub-committee approved premises being adapted as temporary school clinic, at £850.

Taunton.—Somerset C.C. received M.H. consent to borrowing £31,842 in respect of cost of reconstruction and adaptation scheme at County and Divisional Police Headquarters.

Wembley.—T.C. received M.H. consent to borrow £3,780 for sewerage purposes.—£2,500 to be spent on surface water sewer, and tenders invited.

Whitehaven.—T.C. received sancton to borrow £50,349 for houses at Hensingham.

York.—T.C. approved: Alterations "Black Swan," Peaseholm Green, and "Punch-bowl" Inn, Stonegate, for Tadcaster Tower Brewery Co., Ltd.; canteen, British Sugar Corporation, Ltd.

* See also List of Contracts Open.

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